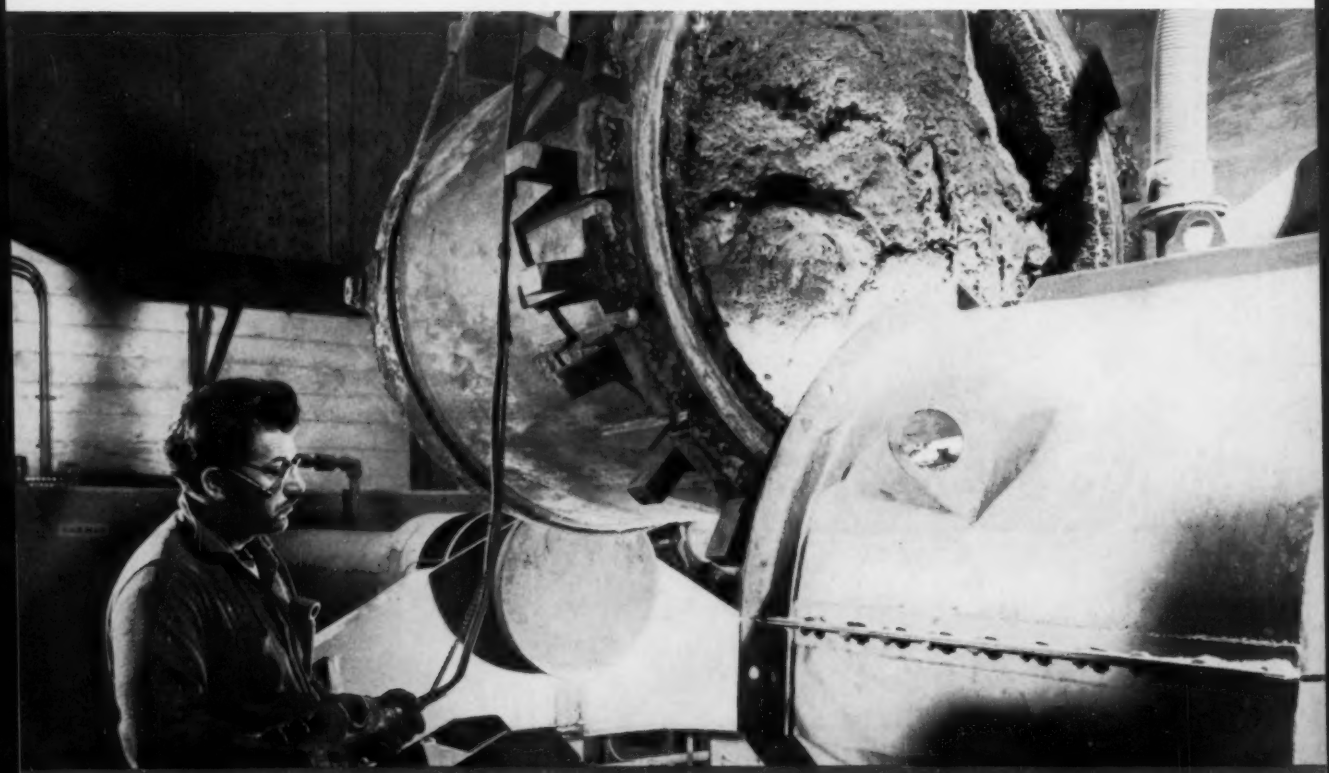
June 7, 1956

The IRON AGE

The National Metalworking Weekly



Will Titanium Ever Go Commercial ? P.111

The Buzzard

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Special sections give auto hinges more strength at less cost

Here are two of the carbon-steel hinge sections we are rolling for automotive manufacturers. Special sections have become increasingly popular for auto and truck doors in recent years, and today are widely used throughout the industry.

Why do auto makers prefer to make door hinges from *rolled* hinge sections? Because rolling provides the needed strength, usually at less cost than any other process.

Whatever your products may be, we urge you to look into the advantages of special sections. By designing with a special section in mind, you can provide strength where it is needed, while eliminating excess metal. This means fewer machining and fabricating operations, less scrap loss. It could add up to substantial savings for your operation.

We would be happy to discuss Bethlehem carbon-steel special bar sections with you. Please contact the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

June 7, 1956—Vol. 177, No. 23

The IRON AGE

Digest of the Week in Metalworking

Starred items are digested at right.

THE IRON AGE, published every Thursday by CHILTON CO., Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to The IRON AGE
Chestnut and 56th Sts. Philadelphia 39, Pa.

NEWS DEVELOPMENTS

WHAT'S BEHIND JOINT STEEL LABOR TALKS? P. 71

Big Three of steel agree to joint negotiations. This gives Steelworkers'

foot in door toward industrywide bargaining. Legal questions are also raised. McDonald would settle quickly if industry makes SUB and wage concessions. Price may be too high.

BRASS MILLS SEEK THE SILVER LINING P. 73

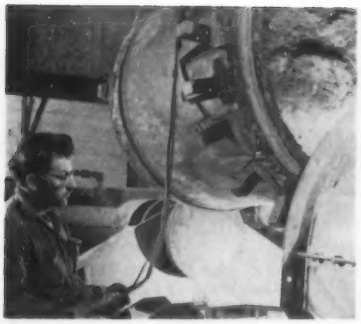
Business is bad, but not equally so for all mills. Factor is auto slowdown. Those who don't usually sell too much to Detroit not in bad shape. Industry confident that fourth quarter will see full production and full order books.

NO TIME TO HEAD FOR BUSINESS STORM CELLAR —P. 74

Business has slowed down somewhat, but don't head for the hills. There's still plenty of life left in the economy and a pickup is on the way. Tom Campbell analyzes outlook.

MANAGEMENT COURTS SALESMEN IN FIELD P. 77

Companies are learning it pays off to meet their salesmen in the field. Some are combining home office and field sessions for best results.



WHERE'S TITANIUM headed? Here's a roundup of expert opinion on future commercial prospects of this current metallurgical world-beater. Photo courtesy Titanium Metals Corp. See condensation below of this special feature beginning on P. 111.

NEXT WEEK:

MINIATURIZE: BIG PAYOFF FROM SMALL IDEAS

Industry is beginnnig to recognize that strength and functionability is not always dependent on substantial size. Better operation and/or a more saleable item are the results of the current trend to miniaturize.

Super finish for turbo-supercharger

A leading manufacturer of turbo-superchargers uses Osborn's Brushamatic 3A to cut compressor wheel finishing costs from 48¢ to 16¢ per part.*
*Trade-Mark

THIS aluminum compressor wheel is the heart of a new turbo-supercharger designed to increase engine horsepower up to 60%. Osborn power brushing methods remove all machining burrs from this compressor wheel . . . maintain a finish tolerance of two ten-thousandths of an inch. In addition to improving the quality of this compressor wheel, Osborn power brushing cuts finishing time from 12 minutes to 4 minutes per part.

The automotive industry is just one of many using Osborn power brushing to improve and speed up finishing operations.

An **O**sborn **B**rushing **A**nalysis, made in your plant, will show how *you* can improve finishes, reduce finishing costs. Write *The Osborn Manufacturing Company, Dept. F-46, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

Why Armco ALUMINIZED STEEL Type 2 lengthens product-life in outdoor service

In commercial production only one year, Armco ALUMINIZED STEEL Type 2 already is proving itself in many kinds of outdoor service.

Before this special Armco aluminum-coated steel was made available, it was tested 15 years in an industrial atmosphere. The tests showed this:

The life of the aluminum coating in outdoor service is at least 3 times that of a standard zinc coating on galvanized steel sheets.

HERE'S WHERE IT'S USED

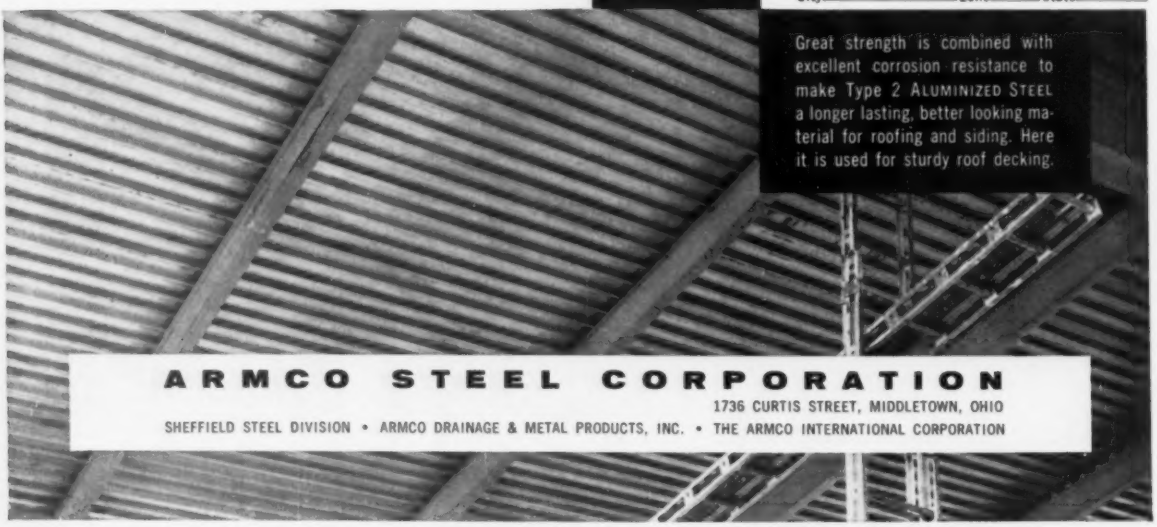
Many products have been improved by ALUMINIZED STEEL Type 2 in its first year of service. A few are listed here. Check the list. Perhaps you make similar products that could be improved by the extra strength and atmospheric corrosion resistance of this new Armco Steel. It is produced in sheets and sheet coils, 14 to 24 gage.

Agricultural Implements
Air Conditioning, Outdoor Housings
Antennae Clips and Supports
Architectural Panels, Back-Up Sheets
Awnings and Supports
Boiler Shrouds
Buildings
Carports
Clothes Driers, Outdoor
Cotton Drying Cabinets
Curtain Walls
Display Racks
Ductwork, Industrial
Electric Pole and Line Hardware
Furnace Air Filter Frames
Garage Doors, Overhead
Industrial Building Sheets, Corrugated
Lighting Fixtures, Outdoor
Rolling Doors
Roofing
Siding
Truck Body Skirt Panels
Truck Trailer Roofs
Tubing
Ventilators

Let us send you complete information about this new Armco Steel for outdoor service. Just fill in and mail the coupon.

Exposed parts of this outdoor lighting fixture defy the weather. They're made of corrosion-resistant Armco ALUMINIZED STEEL Type 2.

ARMCO STEEL CORPORATION
1736 Curtis Street, Middletown, Ohio
Send more data on Armco ALUMINIZED STEEL Type 2.
We manufacture_____
Name_____
Title_____ Firm_____
Street_____
City_____ Zone_____ State_____



Great strength is combined with excellent corrosion resistance to make Type 2 ALUMINIZED STEEL a longer lasting, better looking material for roofing and siding. Here it is used for sturdy roof decking.

ARMCO STEEL CORPORATION
1736 CURTIS STREET, MIDDLETOWN, OHIO
SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

The IRON AGE
FOUNDED 1855

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Indexed in the Industrial Arts Index and the Engineering Index.

ABP NBP

EDITORIAL

Everything and the Kitchen Sink

◆ LAST WEEK David McDonald, the photogenic head of the United Steelworkers of America, asked steel firms for everything including the kitchen sink. Certainly he can't be accused of being pessimistic in his demands. They represented the biggest surprise package ever thrown at steel people since the union won its first contract in 1937.

It must be that steel officials—and union officials—have their tongues in their cheeks: the steel people for being so affable about such a loaded package; the union people for implying they will get a big part of it.

Probably a good term for the demands would be Utopia Unlimited. One can only believe that this is all part of the window dressing that both sides must indulge in before they get down to steel tacks at the "Big Three" New York meetings.

But it might be a good idea to muse over some of the stuff. If it is window dressing today, you can bet it will be the McCoy in the years to come—if the union can make it stick. And they have had success in making these things stick over the years.

Everyone expected that the supplemental unemployment benefit plan, the union shop, the week-end premium time and a "substantial" wage increase would be the major demands. They were. But there was a whole lot more that, if really serious, would shake a lot of steel people to their reinforced boots.

Two more holidays; double the present shift differentials; free medical and sickness benefits; a big hoist in life insurance; one week's vacation for one year's work, two for two and three for five years' service; 8 hours' pay for reporting for work when there is none, against 4 hours now; and incentive plans for everyone not now covered: These are the "extras."

If this package were to be granted, steel firms would have to raise steel prices more than $30 a ton. But that won't happen because the union is just having good clean fun.

Some time in the latter part of this month the four fellows on each side will stow the malarky and get down to cases. Then this show will be over—or a bigger and costlier one will begin.

The realistic package is probably close to 20¢ an hour.

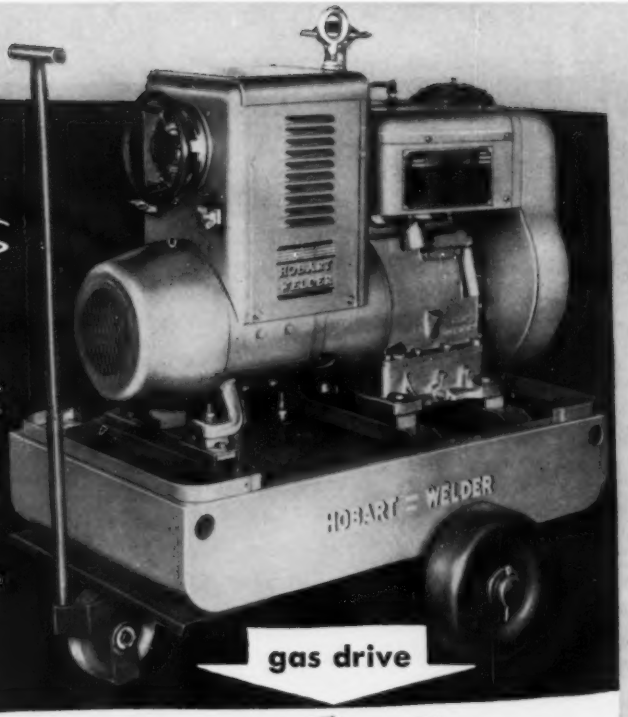
Tom Campbell

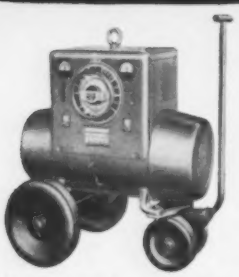
EDITOR-IN-CHIEF

EXTRA advantages in HOBART arc welders

let you do *faster* welding at lower cost

The neatest package of welding energy you ever saw...→ the "Husky Boy." It welds anywhere!





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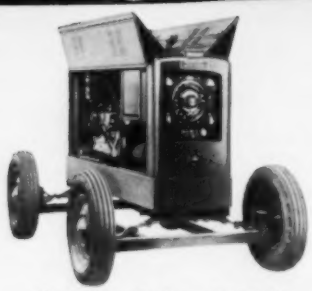
D.C. Rectifier

A Hobart Electric Driven Welder is QUALITY ready for action—it will give you broad welding ranges, faster and smoother welds. Over 25 built-in "extras" in each Hobart add up to years of trouble-free, top performance welding that lets you make money every step of the way. Choose from Hobart's complete line. Select the one that best suits your work, whether it calls for production, maintenance, or repair.



Gasoline Driven Models

You can depend on every Hobart Gasoline Engine Driven Welder's performance—especially where time determines your costs. That's where a Hobart becomes your most valuable tool. Hobart convenience features speed up work and cut costs by simplifying your operation. Mail the coupon below for complete details on the type of welder that most interests you. HOBART BROTHERS CO., BOX IA-66, Troy, Ohio, Ph. 21223.

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BOX IA-66, TROY, OHIO

Without obligation, please send me complete details on the type of welder I've indicated:

_____

_____ (*Amp. Capacity*)

Name _____

Address _____

City _____ *State* _____

dear editor:

letters from readers

Are We Going Soft?

Sir:

Will you please send us six copies of the editorial, "Are We Going Soft?", on p. 7 of your May 24 issue?

I'd send you a complimentary word or two if I weren't scared you'd publish it or them. *Name Withheld.*

We hope similar feelings don't keep others from writing us. If you don't want your name mentioned we'll use initials—or drop it entirely.—Ed.

Throwaway Ceramic

Sir:

Please send three reprints of article "Throwaway Ceramic Turns New Profits from Old Lathes."

We look forward to Iron Age for early news of new developments. We take several trade magazines, but we find yours the first to tell about this new development. *G. E. Nies, Project Engineer, Andrew Corp., Chicago.*

Sir:

In your May 3 issue of The Iron Age you say reprints are available as long as the supply lasts of the article "Throwaway Ceramic Turns New Profits from Old Lathes." In that we are a multi-plant organization with plants located in three different cities, we would appreciate receiving three copies of this article.

Articles as timely as this are an indication of very progressive publication and we are certainly glad to be one of your subscribers. *V. F. Trost, Div. Mgr. of Industrial Engineering Equipment Mfg. Div., Continental Can Co., Inc., Chicago.*

We still have a few reprints.—Ed.

Handling Dollar

Sir:

Please send me a copy of "How to Get More for Your Handling Dollar," which appears in your May 24 issue.

Since I missed the third article in this series, which appeared in the April 26 issue, I am wondering if a reprint of "How to Get More for Your Welding Dollar" is available. I would also appreciate the "Welding Rods & Electrode Charts" which accompanied the article. *A. H. Koenig, Methods Engineer, Radio Corp. of America, Camden, N. J.*

Sir:

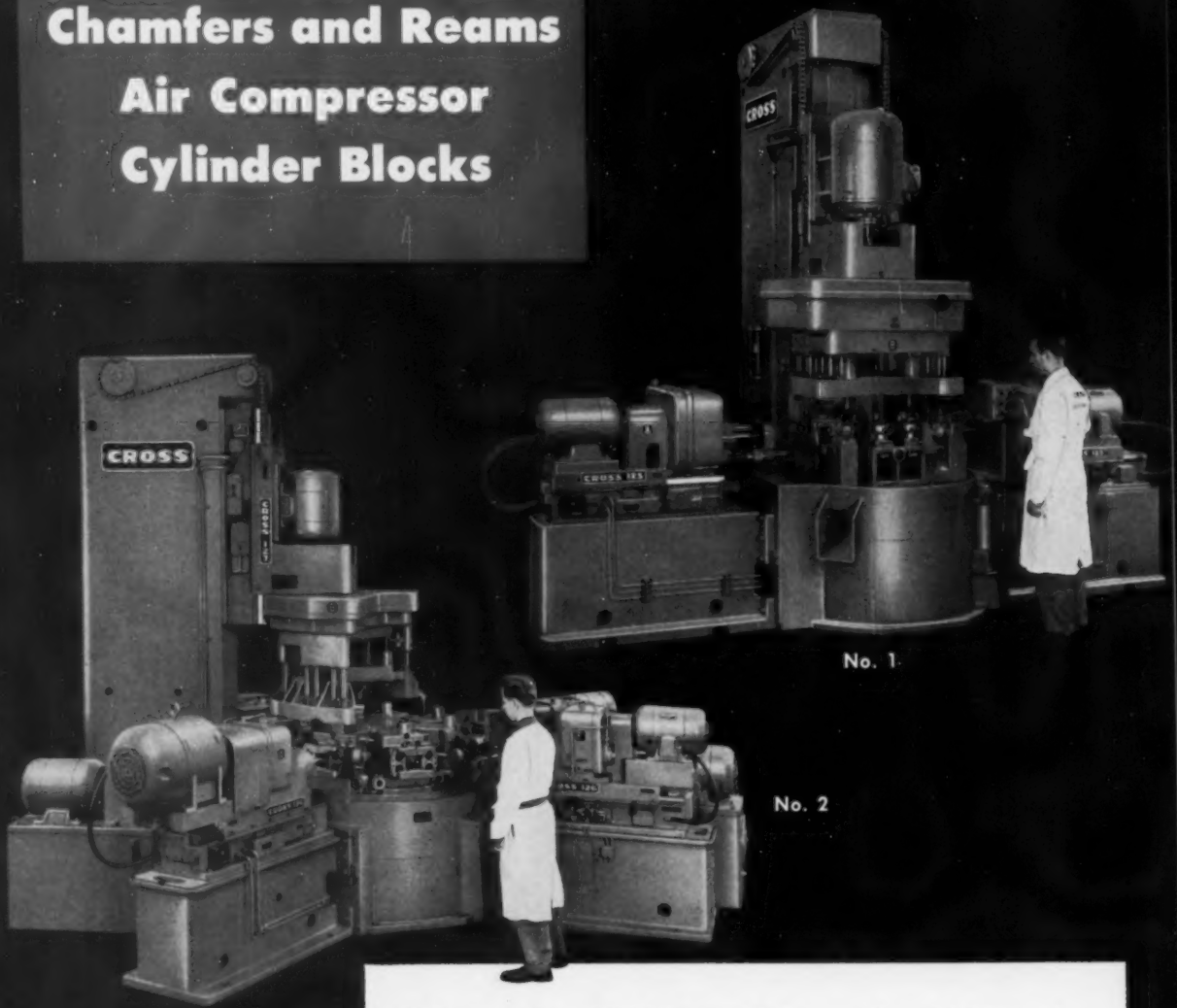
If possible, I would like to get 24 additional copies of "How to Get More for Your Handling Dollar" which was published in your May 24 issue.

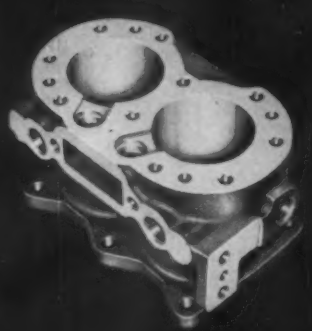
These will be distributed to our Technical Representatives in the field. *N. P. Gentieu, Technical Editorial Dept., American Chemical Paint Co., Ambler, Pa.*

You can still get reprints of both features.—Ed.

More Specials by Cross

Bores, Drills, Chamfers and Reams Air Compressor Cylinder Blocks





- ★ Rough and semi-finish bores cylinders; rough and finish counterbores valve ports; drills, chamfers and reams all holes.
- ★ 129 pieces per hour at 100% efficiency.
- ★ Machine Number One has 4 stations; 1 for loading, 3 for drilling, chamfering and reaming. Machine Number Two has 7 stations: 1 for loading and 6 for machining.
- ★ 2 position, progressive type work holding fixtures for both machines, each arranged to handle 6 similar parts.
- ★ All parts in Cross machines—even tooling details—are made to interchangeable tolerances for fast, easy maintenance and flexibility for part design changes.
- ★ Other features: Construction to JIC standards; hydraulic feed and rapid traverse; hardened and ground ways; automatic work cycle.

Established 1898

THE CROSS CO.

First in Automation

DETROIT 7, MICHIGAN

fatigue cracks

by William M. Coffey

The Gold Plated Pulley

Out in fabulous Las Vegas a pride of publicity men opened a new hotel last month amid ceremonies appropriate only to that fabulous oasis. (The new 15-story, 155-room hotel Fremont is Nevada's tallest building, says the handout.) "What," the press agents asked, "could be more appropriate than to make a pitch to the metal-working convention trade by choosing a Miss Iron Age and posing her next to a gold plated (no-fooling) pulley on an air-conditioning blower?" What indeed!

We had nothing to do with this idea, nor with the costume in which Miss Iron Age was partially attired. Ray Kay, our West Coast man-on-the-spot, sent in a couple of photographs which are most interesting and show for sure the "Miss Iron Age" ribbon across the lady's front. Unfortunately for you, dear reader, the editors called the shots too Hollywoodish and so they repose in our lower left desk drawer along with "Miss Gear & Pinion of 1949."

Plan Ahead

Our recent query on the origin of the PLAN AHEAD poster has produced a progress report. Ole Darcey, one of this column's 23 regular readers, says he first saw it on the back of a bulletin put out by National Research Bureau, Chicago.

Puzzlers

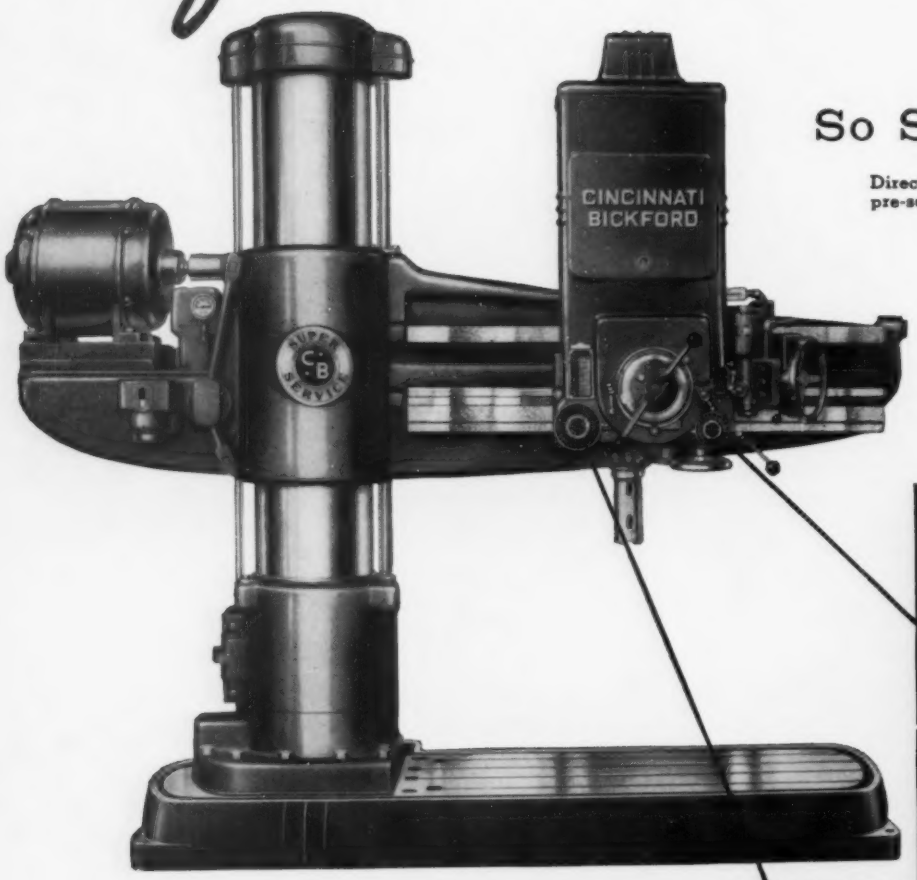
The May 10 puzzler? Like falling off a log. Winners: Mark Doty, Thomas Brick & Tile Co.; Jim Mull w/Mary Ann, The North American Mfg. Co.; Bill Mess; Lola Bosstick, Met. Laboratory, Clark Equipment Co.; Richard Dale Lambert, Duo-Therm; Marion Hamacher, Borg-Warner Corp; Sari and the General Steel Castings Corp. Iron Age Puzzle Solvers; Chris Rick, DuPont; John Herb, Westinghouse; Ole Darcey; W. C. Cook, who also says, "yours is one of the few magazines I can read with pleasant equanimity in this era of Tension," W. C. Nabors Co.; A. C. Willis, Temco Aircraft Corp.; D. M. Ertner, Western Electric; and Joseph D. Settles, Chrysler Corp. Answer? 70 children, 19 women, 11 men.

New Puzzler

Sarie of the GSCCIAPS (above) sends this one: Grandpa was a child for 1/6 of his life, a youth for ½, and a bachelor for 1/7. Five years after his marriage, a son was born who lived ½ as long as his father and who died 4 years before his father. How long did Grandpa live?

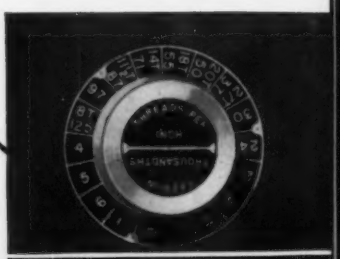
SOLUTION to May 3 puzzle, arranging 12 coins in such a way that seven straight lines will hit them, and having at least four coins per line.

So *quick*... So EASY...



So SIMPLE...

Direct and quiet shifting into pre-selected speeds and feeds.



HYDRAULICALLY PRE-SELECTS all 18 feeds

Positive geared tap leads and feeds are quickly pre-set.

HYDRAULICALLY PRE-SELECTS all 36 speeds

Speeds and tool diameters shown in large easy to read figures.

Super-Service Radials are available with complete hydraulic pre-selection of all 36 speeds and 18 feeds. Two convenient direct reading dials control the automatic shifting of sliding gears. While the tool is cutting, merely set the dials to the speed and feed for the next operation. As the spindle is stopping for inserting the next tool, the shifting is done hydraulically . . . directly, quietly and quickly. No other operations—no loss of time. Write for catalogs.

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dates to remember

JUNE

RADIO ELECTRONICS TELEVISION MANUFACTURERS ASSN.—32nd annual convention, June 12-14, Edgewater Beach Hotel, Chicago. Society headquarters, 777 14th St., N.W., Washington, D. C.

THE NATIONAL ASSN. OF METAL FINISHERS — Annual meeting and fifth management seminar, June 17-18, Mayflower Hotel, Washington, D. C. Society headquarters, 35 E. Wacker Dr., Chicago.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Semi-annual meeting, June 17-21, Hotel Statler, Cleveland. Society headquarters, 29 W. 39th St., N. Y.

EXPOSITIONS

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

THE SOCIETY OF THE PLASTICS INDUSTRY, INC., June 11-15, New York City.

ASSN. OF IRON & STEEL ENGINEERS, Sept. 25-28, Cleveland.

METAL SHOW—Oct. 8-12, Cleveland.

MATERIAL HANDLING INSTITUTE—3rd annual material handling training conference, June 17-30, Lake Placid, N. Y. Society headquarters, 813 Clark Bldg., Pittsburgh.

AMERICAN ELECTROPLATERS' SOCIETY—43rd annual convention, June 18-21, Hotel Statler, Washington, D. C. Society headquarters, 445 Broad St., Newark, N. J.

AMERICAN MARKETING ASSN.—National conference, June 20-22, Hotel William Penn, Pittsburgh. Society headquarters, Aluminum Co. of America, Pittsburgh.

PRESSED METAL INSTITUTE — National sales conference, June 22, Hotel Carter, Cleveland. Society headquarters, 3673 Lee Rd., Cleveland.

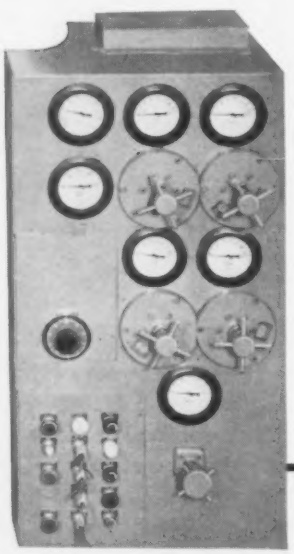
AMERICAN SOCIETY FOR TESTING MATERIALS — 61st annual meeting, June 22-28, Hotel Statler, Boston. Society headquarters, 1916 Race St., Philadelphia.

ALLOY CASTING INSTITUTE—Annual meeting, June 24-26, The Homestead, Hot Springs, Va. Society headquarters, 32 Third Ave., Mineola, N. Y.

DROP FORGING ASSN.—Annual meeting, June 24-27, The Homestead, Hot Springs, Va. Society headquarters, 605 Hanna Bldg., Cleveland.

Farquhar... the first triple-acting press with electric magnetic controls...

EVERY ADJUSTMENT of speed, timing and pressure is made by the operator on this Control Panel without leaving his operating station. It is no longer necessary for him to climb to the top of the press for this purpose.



...the only press that can do so many things so well

THIS hydraulic press revolutionizes the high speed production of draw-formed parts. We believe that it has rendered obsolete every double-acting and triple-acting press now in service. These are challenging statements... *but read the facts.*

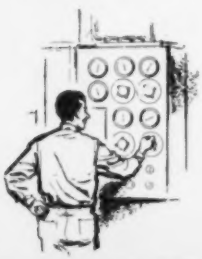
A. B. Farquhar Division, The Oliver Corporation
Press Department, York 23, Pennsylvania

OLIVER

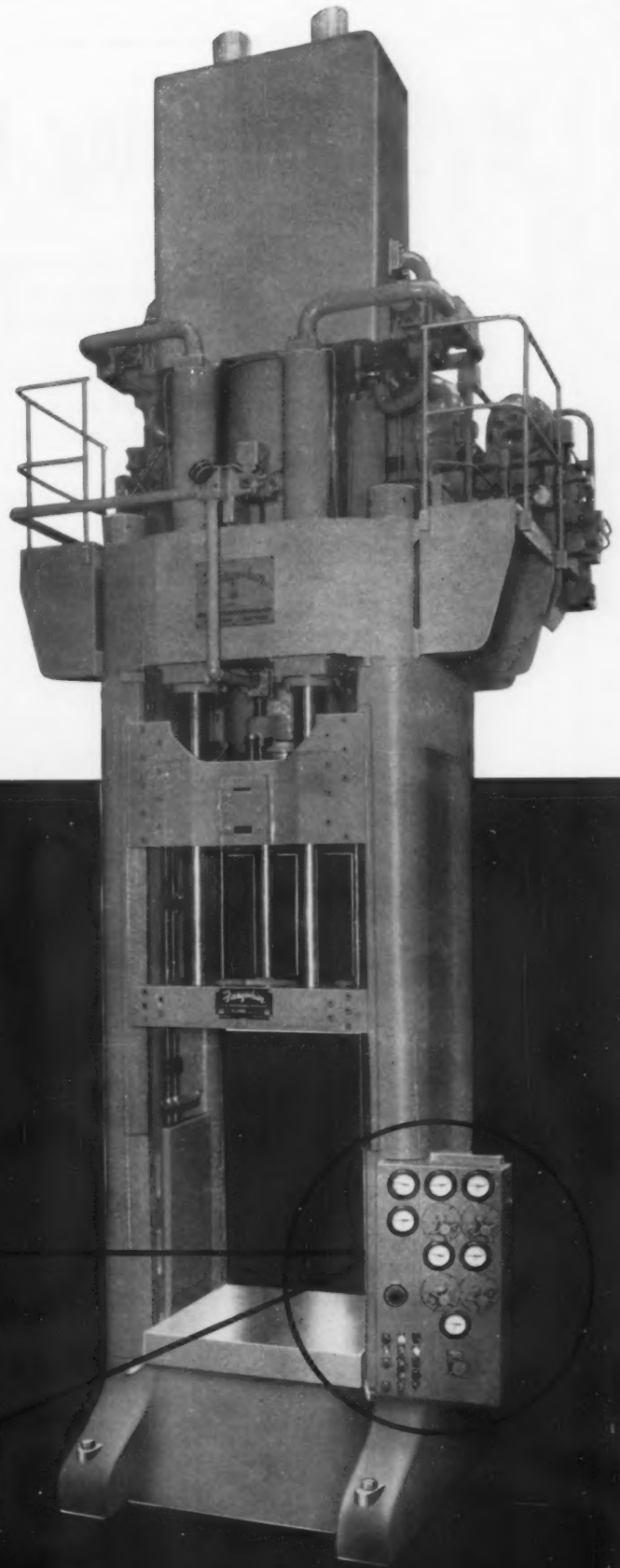
Farquhar **PRESSES**

DRAWING • FORMING • FORGING • STRAIGHTENING • BENDING

- **Unlimited speed changes** now possible at any point in the cycle. This means, for example, that the ram can approach the draw at maximum speed, slow down as it enters the draw, change speed in the middle of the draw, strip slowly and return to up position at maximum speed.
- **Draw-forming of difficult materials** is thereby greatly simplified and improved. The exact speed can be selected which is best suited to the characteristics of the material at any point in the stroke.
- **Expensive dies** can be given added protection by "gentle" treatment at point of contact and withdrawal.
- **Cycle time is greatly reduced,** because maximum speeds can be attained at every desired point in the cycle.



- **No expensive cams** with time-consuming adjustments are needed to obtain these results. All speed changes are made by dial settings on the control panel.



- **4-point adjustment of blank holder pressure** is made by operator without leaving operating station, an important device in the draw-forming of eccentric shapes. This has been a feature of Farquhar Double-Acting Presses in the past. It is an important feature of the new Farquhar Double and Triple-Acting Presses, too.
- **Best of all,** with these additional advantages, the Farquhar Double and Triple-Acting Presses are competitively priced!
- **For a more complete description** of these new Farquhar Presses with electric magnetic controls, write for Bulletin A-200. Please use your company stationery. A. B. Farquhar Division, The Oliver Corporation.

Speeds are pre-set by these radio-type dials which can be located within the main control panel or in a remote position.

FORCING • ASSEMBLING • EXTRUDING • AND OTHER OPERATIONS

Metal Finishing Issue Preview

FOR READERS . . . the June 28th issue of The IRON AGE will offer, in two sections, dollar-saving ideas that show how you can get the most from your Metal Cleaning and Finishing:

1 How to Get More for Your Plating Dollar. Choosing the right equipment. Saving through good control, eliminating wasteful practices, reducing handling. New coatings that eliminate more expensive coatings, reduce processing steps. Latest developments in plating of zinc, brass, nickel, chromium, copper and alloys.

2 Cleaning and Finishing Handbook. Packed solid with up-to-the-minute information and tables on such subjects as:

a) Spot test identification of metal surfaces
b) Pickling, cleaning, degreasing
c) Electrolytic cleaning
d) Barrel deburring, polishing and buffing
e) Polishing wheels
f) How to select power brushes
g) Rust preventives
h) Surface treatments for aluminum alloys
i) Surface treating magnesium alloys
j) Phosphate surface treatments
k) Cadmium, chrome, nickel, brass and zinc
l) Organic coating materials
m) Drying
n) Chemical conversion coating
o) Surface cleaning
p) Chlorinated solvents
q) Cast shot and cleaning grit
r) Metallic coatings

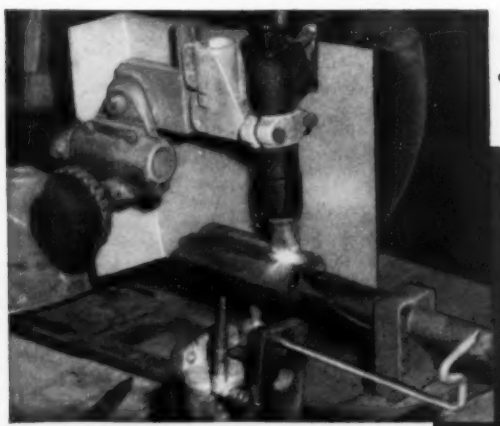
FOR ADVERTISERS . . . it offers an opportunity to tie in with the fifth major editorial effort in The IRON AGE "How to Get More for Your Metalworking Dollar" series . . . a series which is getting unprecedented attention among executives throughout metalworking.

DEADLINE JUNE 15, 1956

The **IRON AGE** Chestnut & 56th Streets, Philadelphia 39, Penna. SH 8-2000

GAIN NEW SPEED AND WELD QUALITY

in light-gage metal fabricating



HELIARC welding has increased both the production speed and weld quality of these stainless steel parts.

Throughout industry, from production line operations to one-of-a-kind jobbing, HELIARC argon gas-shielded welding is helping fabricators gain new top weld-quality and production speed. These typical pictures show how HELIARC welding is used to efficiently fabricate sections of the Cory "Crown Jewel" percolator.

SETUPS DESIGNED TO FIT JOB NEEDS

These .031 in. type 302 stainless steel parts are fabricated in two fast, efficient operations. A mechanized HELIARC torch is used to butt weld a seam in the percolator's spout —and a stationary HELIARC torch welds the bottom section to the unit's body while parts rotate.

WELDING IS FAST, WELDS ARE SOUND

It takes only a few seconds to complete a 4½-in. long butt weld in the percolator spout. In the second HELIARC welding setup, a 17-in. circumferential weld on the percolator bottom is completed in only a fraction of a minute.

WIDE RANGE OF EQUIPMENT AND APPLICATIONS

HELIARC welding setups are available for manual, semi-automatic, and automatic operations. All are ideal for a wide range of light-gage metal jobs. Call your local LINDE representative and find out which HELIARC welding apparatus is best suited for your fabricating needs. Start saving now—call today.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Other Principal Cities

In Canada: LINDE AIR PRODUCTS COMPANY

Division of Union Carbide Canada Limited, Toronto

"Heliarc" and "Linde" are registered trade-marks of Union Carbide and Carbon Corporation.

Linde
Trade-Mark

GENERAL ELECTRIC ANNOUNCES . . .

NEW Industrial

Direct-current Motor

KINAMATIC* a new standard in direct-current motors, gives your machines wider speed ranges, greater output

To meet modern industrial needs for faster, more automatic, more continuous production, General Electric has designed an entirely new direct-current motor—the d-c Kinamatic.

Designed for Automation—Now, a direct-current motor has been designed for the modern job it has to do—either as individual motor drive or in regulating systems. The new General Electric d-c Kinamatic motor supplies the wide speed range and versatility required for today's manufacturing methods. It is designed for the close control of machines and split-second timing of processes essential to higher output.

Accelerated Production—The new d-c Kinamatic motor will modernize your equipment, give it increased power, higher speeds, greater output capacity. With the quick-acting G-E Kinamatic motor, your machines will process a greater variety of products . . . faster . . . easier . . . and with less maintenance and spoilage.

More Powerful—By combining advanced design with improved materials and manufacturing techniques, General Electric engineers have packed more power into the entire Kinamatic line. The powerful Kinamatic motor, with new stamina and durability, is ready to become one of your most effective weapons for keeping costs down, for meeting competition, for boosting productivity levels.

Engineering Help—Industrial specialists in 149 conveniently located General Electric Apparatus Sales Offices have the complete story on how the new d-c Kinamatic motors and generators can benefit your operation. For full details, contact your G-E Sales Representative, or write for Bulletin GEA-6355. *Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.* 813-1

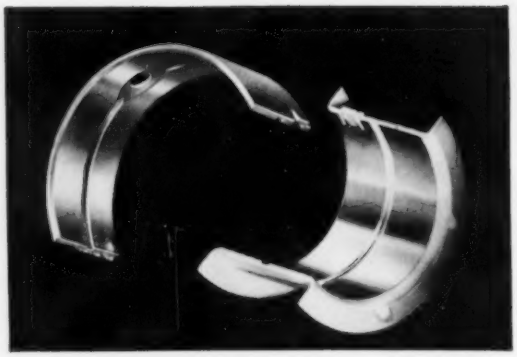
* Trade Mark of the General Electric Company

Progress Is Our Most Important Product

GENERAL ELECTRIC

The PROOF of the STEEL is in its PERFORMANCE

How DSC Strip Splits .001's to Hold Close Tolerances for Precision Bearing Makers



THE FACTS

Makers of precision sleeve and ring-type bearings are among our "least tolerant" customers!

Their sizes cover a range from about 4½" to 8½" in width, from about .040" to .187" in thickness. Here are the thickness tolerances. The percentage figures show how much of our aggregate 1Q '56 bearing strip tonnage was shipped in each tolerance "band."

±.002" and ±.0015" (5.1%)	±.00075" (5.3%)
±.001" (59.6%)	±.0005" (30.0%)

These are total tolerances including "crown."

Based on "the amount of restriction closer-than-total-standard tolerance," over 95% of our 1Q '56 bearing strip tonnage was restricted over 64% and as much as 86.6%. (On written request further information will be submitted to close-gauge strip users.)

THE RECORD

Notwithstanding tight thickness tolerances and strict temper and finish requirements—out of the hundreds of tons of DSC bearing strip shipped during the three-month period ended March 31, 1956, not a single pound was rejected.

JOB-PERFORMANCE SCORE...100%

For the 15-month period from January 1, 1955, through March 31, 1956, the job performance of DSC bearing strip averaged 99.391%.

Whether your job calls for standard or restricted thickness tolerance, light or heavy gauge, satin or bright finish, low or high carbon . . . you'll find DSC *stripmanship* the same.

Can we be helpful to you? How about calling one of our DSC Customer Representatives . . . today?

Customer Satisfaction Is Our No. 1 Job

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

DISTRICT SALES OFFICES:
Charlotte, N. C., Chicago, Cincinnati, Columbus, O., Dayton, O., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., New York, St. Louis, Toledo, Worcester, Mass.

MILLS | PORTSMOUTH, OHIO (Sheets, Rods, Wire)
DETROIT, MICH. and HAMDEN, CONN. (C.R. Strip)

DSC MILL PRODUCTS
Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip • Flat Cold Rolled Carbon Spring Steel
Low and Med. Carbon Manufacturers' Wire • High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement • Rope Wire • Tire Bead Wire
Welded Wire Fabric

RELIANCE *EXPRESS* SERVICE

ON READY-TO-USE *Job-Fitted* SHEET AND STRIP

COLD ROLLED STEEL STRIP: Coils • Cut Lengths • All tempers
SHEETS: Cold Rolled • Hot Rolled • H.R. Pickled • Galvanized • Long Terne

Experience-Fitted to Your Job

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RELIANCE STEEL

DIV. DETROIT STEEL CORPORATION

General Office: Detroit 9, Mich.

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JUNE 22

FIRST ANNUAL SALES CONFERENCE for PMI MEMBERS
JUNE 22, 1956 • HOTEL CARTER, CLEVELAND
For reservations write
PRESSED METAL INSTITUTE, 3673 Lee Road, Cleveland 20, Ohio

PMI

Adv. Courtesy DSC

IT'S CRITICAL

IT'S COMPLEX . . . . . IT'S FORGED

This critical jet engine "case ring" with its odd protrusions, thin section and large diameter, would have been a designer's dilemma a short time ago.

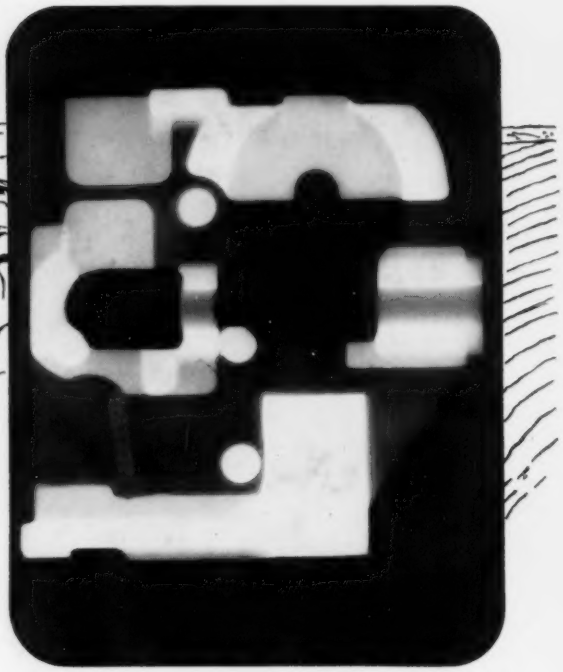
Today, Cameron's advanced forging technique, developed on some of the world's largest and most unusual presses for ferrous forgings, has opened new vistas of design, high production and economy.

WRITE

Cameron

IRON WORKS, Inc.

SPECIAL PRODUCTS DEPARTMENT
P. O. Box 1212, Houston, Texas



Keener "sight" for inspection

High-contrast Ansco Superay "B" film searches critical part for defects

Ansco watches over quality for industry

THE RIGHT FILM FOR EVERY X-RAY NEED:

SUPERAY "A"
Versatile! A "workhorse" film!

SUPERAY "B"
Fine grain for maximum definition!

SUPERAY "C"
High-speed for production-line inspection.

THE RIGHT CHEMICALS FOR PERFECT PROCESSING RESULTS:
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Foundries and welding shops know the best way to build a reputation for quality . . . radiographic inspection using Ansco Superay "B". For this is the film that provides proof of soundness even in the thickest metal parts or weldments. It gives shops proof of good manufacture and customers visual proof of products quality.

One of the first films tailored especially for industry, Superay "B" is the highest contrast Ansco film of them all—ideal for use with all voltages. Call on Superay "B" for consistently accurate readings of heavy metal weldments, castings, forgings—wherever outstanding definition and detail are desired.

Are you broadening your use of radiography? Or establishing it for the first time? Ansco films and chemicals are backed by over a century of skill, by exhaustive chemical research, by experience on a broad variety of accounts (serviced, always on a personal basis). Let Ansco watch over your quality!

America's oldest maker of photographic materials . . . Ansco

Photograph shows CARBOFRAX® brick, raised to white heat (2460°F) in kiln, being plunged halfway into cold water —without spalling or cracking.

third in a series...

THERMAL SHOCK RESISTANCE

Unusual Properties of Refractory Materials

Thermal Shock Resistance in a refractory enables it to withstand rapid recurring temperature changes without spalling and cracking. Several properties affecting the degree of resistance include: thermal conductivity, ultimate strength, thermal expansion and modulus of elasticity.

A number of refractories developed by Carborundum are noted for having these properties in the ranges that insure high heat shock resistance. They successfully meet the stresses and strains imposed by intermittent firing and by high heat releases in restricted areas. In packaged steam generator service, for example, they are far superior to other lining materials. Similarly, they have produced outstanding results in rapidly-heated quickly-cooled crucible type melting furnaces, in heat treating furnaces, incinerators, still settings, etc.

The current issue of Carborundum's magazine "Refractories" features a comprehensive article on heat shock. It may offer suggestions helpful to you in handling a condition of this nature. Send for your copy today.

CARBORUNDUM

Registered Trade Mark

VALUABLE INFORMATION FOR USERS OF:

REFRACTORIES • CASTABLE CEMENTS • POROUS PLATES AND TUBES

CATALYST SUPPORTS • OXIDE, BORIDE, NITRIDE AND CARBIDE

HIGH-TEMPERATURE MATERIALS • CERAMIC FIBER

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MAIL THIS COUPON TODAY

Dept. B66, Refractories Division
The Carborundum Company, Perth Amboy, N. J.

Please send me the forthcoming issue of "Refractories".

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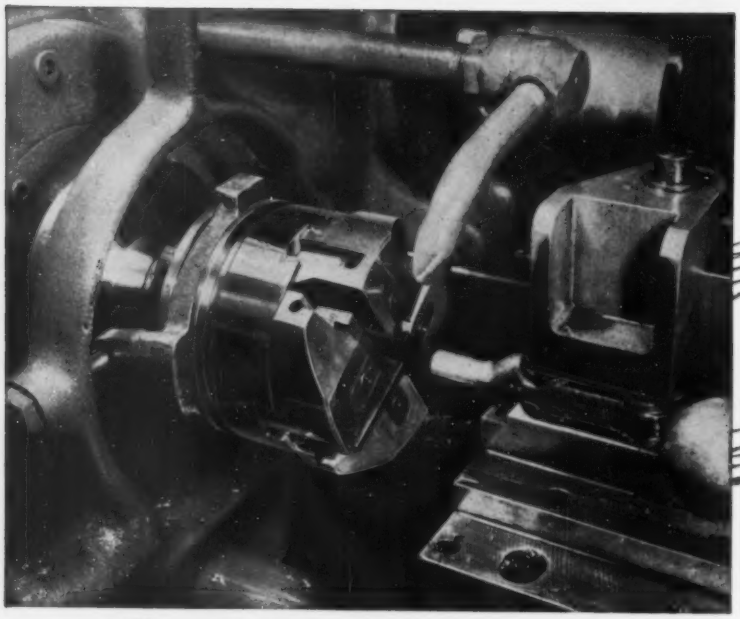
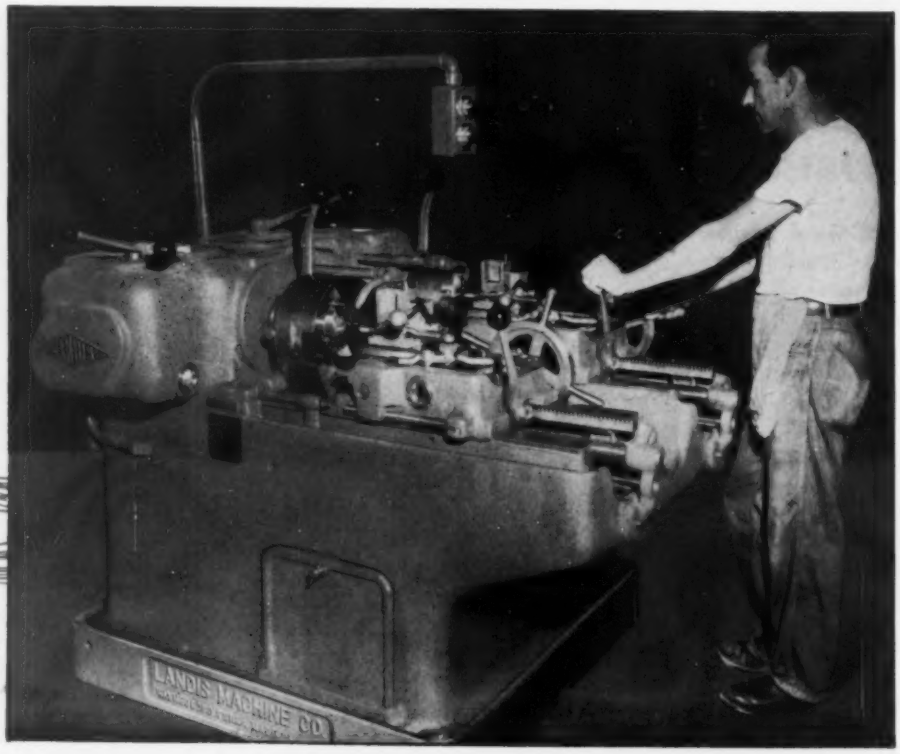



LANDIS MACHINE CO

FASTER TURNING

Using 4 Cutting Tools

SIMULTANEOUSLY

Automotive parts production at Thompson Products in Detroit has been substantially increased by turning, facing, and chamfering on Landis Threading Machines. This LANDIS **Hollow Milling** technique makes large out-put increases possible by applying a number of simultaneously-functioning cutters, thus multiplying the feed rate of a single tool.

The illustrations show one of these parts, steering links, being turned and faced on a LANDMACO Double-Spindle Leadscrew Threading Machine. SAE 1040 steel forgings are turned (1/32" stock removal) 1 1/8" in length and faced by four special turning cutters in 7/8" V LANCO Hardened and Ground Heads. Production regularly averages 200 pieces per hour, with the 5/8" turned diameter held within ±.004". Four hours production is obtained between cutter grinds.

This LANDIS technique offers important advantages over other methods of turning, forming, and facing. The use of four or six simultaneously-functioning cutters, in addition to increasing production, reduces tool cost and workpiece spoilage to the minimum. The diametrically-opposing cutters evenly distribute cutting strains and maintain proper work alignment. LANDIS Cutters, available in a wide variety of styles, are economical for they are usable for most of their length with only a simple regrinding of the rake angle.

Additional information will be sent on request—please include specifications when writing.

THE WORLD'S LARGEST MANUFACTURERS OF THREAD GENERATING EQUIPMENT

LANDIS Machine CO. WAYNESBORO PENNSYLVANIA

BIZ-C

in ALCO Rolled Forgings and Rings Means...

faster machining...with less power...reduced tool wear

Trade-mark Reg. applied for

Patent applied for on lead-addition method.

ALCO HI-QUA-LED STEEL is five ways better for anyone who removes metal with a tool from rolled forgings and rings.

1 FASTER MACHINING – the presence of lead in ALCO's new Hi-Qua-Led tends to lubricate the cutting action. Whether you're milling, threading or machining on a lathe or boring mill, you get heavier cuts at faster speeds . . . perform fewer cutting operations.

2 LONGER TOOL LIFE – Hi-Qua-Led's special properties minimize frictional heat. Tools operate at lower temperature – so they last longer. You save on replacement and re-dressing costs. If you wish, lower grade tools may be used.

3 IMPROVED SURFACE FINISH – Hi-Qua-Led's clean cutting characteristic produces a fine surface – so smooth, by the way, that in some cases a roughing tool can be used to obtain the desired finish.

4 LESS POWER NEEDED – with Hi-Qua-Led you need much less power on your machine tools. Motors can be operated at lower horsepower. The cutting tool moves easily through the work even on heavy cuts with much less effort than on ordinary steels.

5 EXCELLENT PHYSICAL PROPERTIES – tensile strength, ductility, impact strength and notch resistance are the same in tested leaded and unleaded samples of the same heat.

You can test ALCO Hi-Qua-Led Steel and see its advantages in your own shop. We will be glad to make up part of an order for circular forgings using steel to your specifications and the balance with Hi-Qua-Led Steel. Ask your nearest ALCO representative or write P. O. Box 1065, Schenectady 1, New York.

ALCO

ALCO PRODUCTS, INC.

New York

Sales Offices in Principal Cities

ALCO PRODUCTS, INC.
P.O. Box 1065, Schenectady 1, N. Y.

Please send your brochure, "Facts About Leaded Steel for Seamless Forged and Rolled Rings."

☐ For reference ☐ For immediate project

NAME..... TITLE.....

COMPANY.....

STREET.....

CITY..... ZONE..... STATE.....

Maytag switches to STANICOOL HD *Soluble Oil... makes two-way saving*

1 *Cost of soluble oil reduced*

2 *Soluble oil consumption cut two-thirds*

A 300 ton Verson press at the Maytag plant, Newton, Iowa, is used for piercing holes in the inner tubs of Maytag's fine automatic washers. Material used is 18 gauge enameling iron. Holes are pierced in six automatic cycles. A total of 936—$\frac{3}{16}$ inch holes and 6—$1\frac{9}{32}$ inch holes are incised in each tub.

A check of manufacturing costs on the tubs disclosed that the cost of soluble oil per unit produced was too high. Standard Oil lubrication specialist J. I. Nelson, working with plant management, suggested a switch to STANICOOL HD Soluble Oil. The switch was made and Maytag received the first part of its two-way saving: the cost of soluble oil per gallon was reduced. Then it was found that the same high quality product could be turned out, without loss of tool life, while spraying only every third tub. Formerly *each* tub was sprayed with soluble oil before punching. With STANICOOL HD, Soluble Oil consumption was reduced two-thirds. And thus, Maytag received part two of its two-way saving.

Perhaps STANICOOL HD Soluble Oil can help you make similar savings. Find out more about this quality soluble oil. Call your nearby Standard Oil office. There is one near you in any of the Midwest or Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Maytag, leader in cutting laundry time for modern homemakers, knows how to cut manufacturing costs, uses STANICOOL HD.

Dwight Norton (right), a Maytag plant foreman, inspects automatic washer inner tub with Jesse I. Nelson, Standard Oil lubrication specialist. Jesse Nelson is well qualified to provide lubrication technical service. He has a B. S. degree in engineering from the University of Iowa and has completed the Standard Oil Sales Engineering School. Jesse has been helping customers with lubrication problems for more than three years. Customers find his experience and training pay off for them.

Quick facts about STANICOOL HD Soluble Oil

- Emulsifies readily with all waters.
- Forms stable, uniform emulsion.
- Does not turn rancid.
- Non-injurious to men, machines and work.
- Economical. Meets work requirements with relatively low emulsion concentrations.
- Prevents rusting of work and machines.
- Gives better tool life.
- Doesn't form gum on machines.

STANDARD

STANDARD OIL COMPANY
(Indiana)

"Operations Kingsbury" The result is always

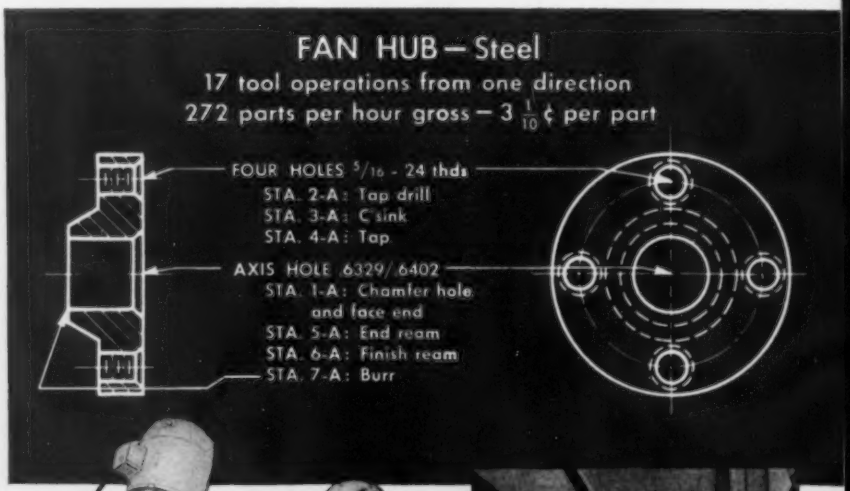
The simple operations performed by these two Kingsburys might lead one to ask: "Why use automatic drilling and tapping machines for this work?"

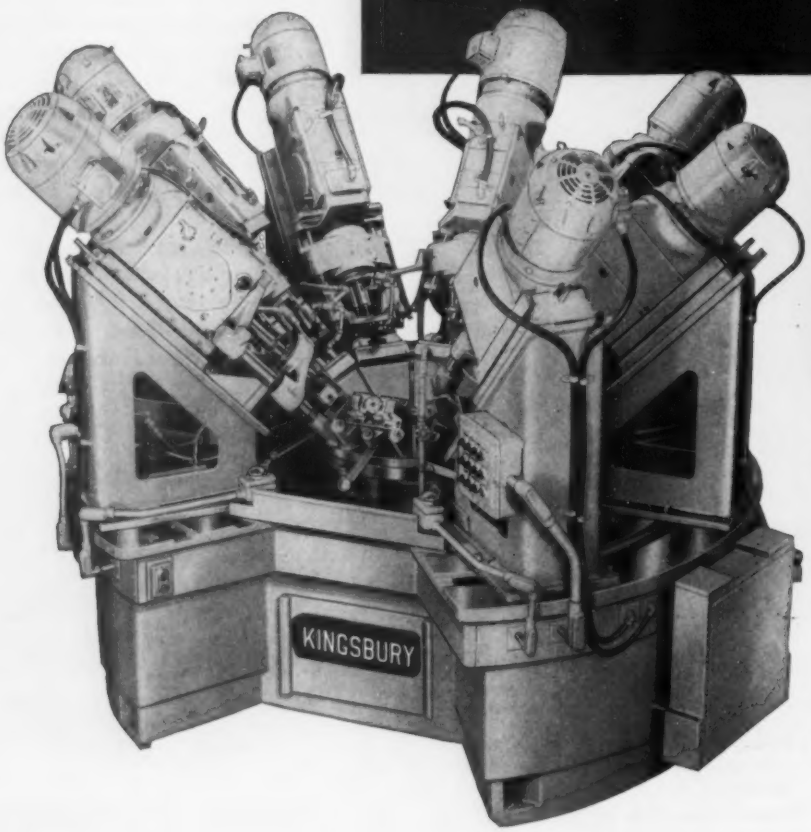
Let's take another look.

Notice that the two parts have several features in common. Each part is round. Each part has an axis hole which requires a chamfering operation at the "top." This operation prevented the use of any hold-down mechanism working on the top of the part. In the case of the Differential Bearing Support, the rim around the axis hole is too narrow. In the case of the Fan Hub, the top surface is wide enough, but specifications called for facing this surface.

So, in each case we used opposing jaws. These jaws grip the outside diameter and hold the part in a vise-like grip.

Fan Hub called for 17 tool operations — normally from two directions. We designed the machine with a 96-inch base and 26-inch table, indexing through eight stations — one for loading and unloading. Seven Kingsbury units are mounted on the base, each at an angle of 45°, and the parts are presented in the





Fan Hub part is held with axis hole at 45°, flat side up. Two serrated jaws clamp the part just below the flat face. Bushings guide tools as required. Fixture is manually loaded and clamped; is automatically unclamped for manual unloading.

the same: interchangeable parts at low cost

fixtures at this same angle. Fixtures are loaded and clamped manually — unclamped automatically.

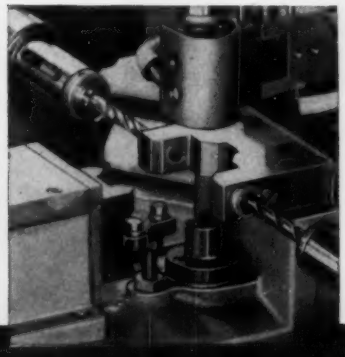
All work is performed from one direction. At *Sta.* 1-A a combination tool faces the top surface and chamfers the axis hole. At *Stas.* 2-A, 3-A and 4-A the four holes are tap-drilled, countersunk, and tapped for 5/16-24 thread. Units at *Stas.* 5-A and 6-A end-ream and finish-ream the axis hole .6392/.6402 dia. To remove the burr on the back we use a recessing tool through the axis hole — at *Sta.* 7-A.

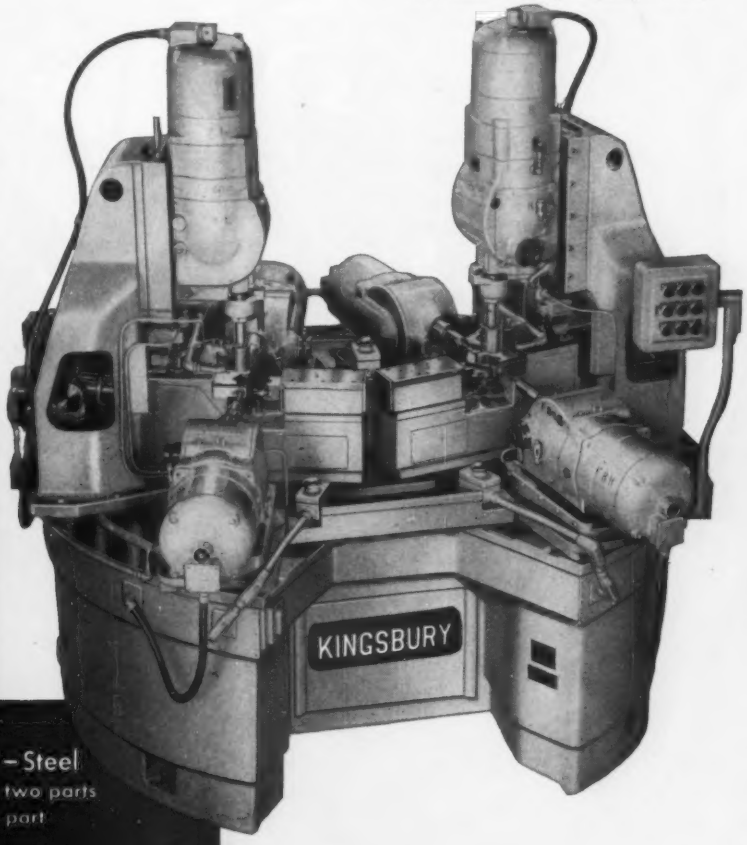
For the Differential Bearing Support we used an 80-inch base and two stationary work-holding fixtures, one at the left and the other at the right — actually two machines on one base. The part is placed in each fixture with the axis vertical, tapered end at top. The opposing jaws of the fixtures clamp and unclamp automatically. Horizontal front and back units are equipped with combination tools which drill and countersink the .3437 dia. holes. Vertical units chamfer the 1.48 dia. hole.

Why use a Kingsbury in each of these cases? For high output with low cost per part — *as usual.*

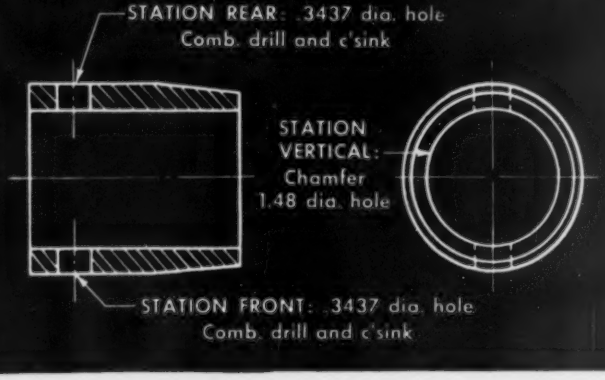
Kingsbury Machine Tool Corporation
117 Laurel St., Keene, N. H.

Differential Bearing Support part is held with axis hole vertical and tapered end at top. Two jaws (one fixed, one movable) clamp the part on the outside diameter. Bushings in the fixture guide the drills. Fixture clamps and unclamps automatically; loading is manual.





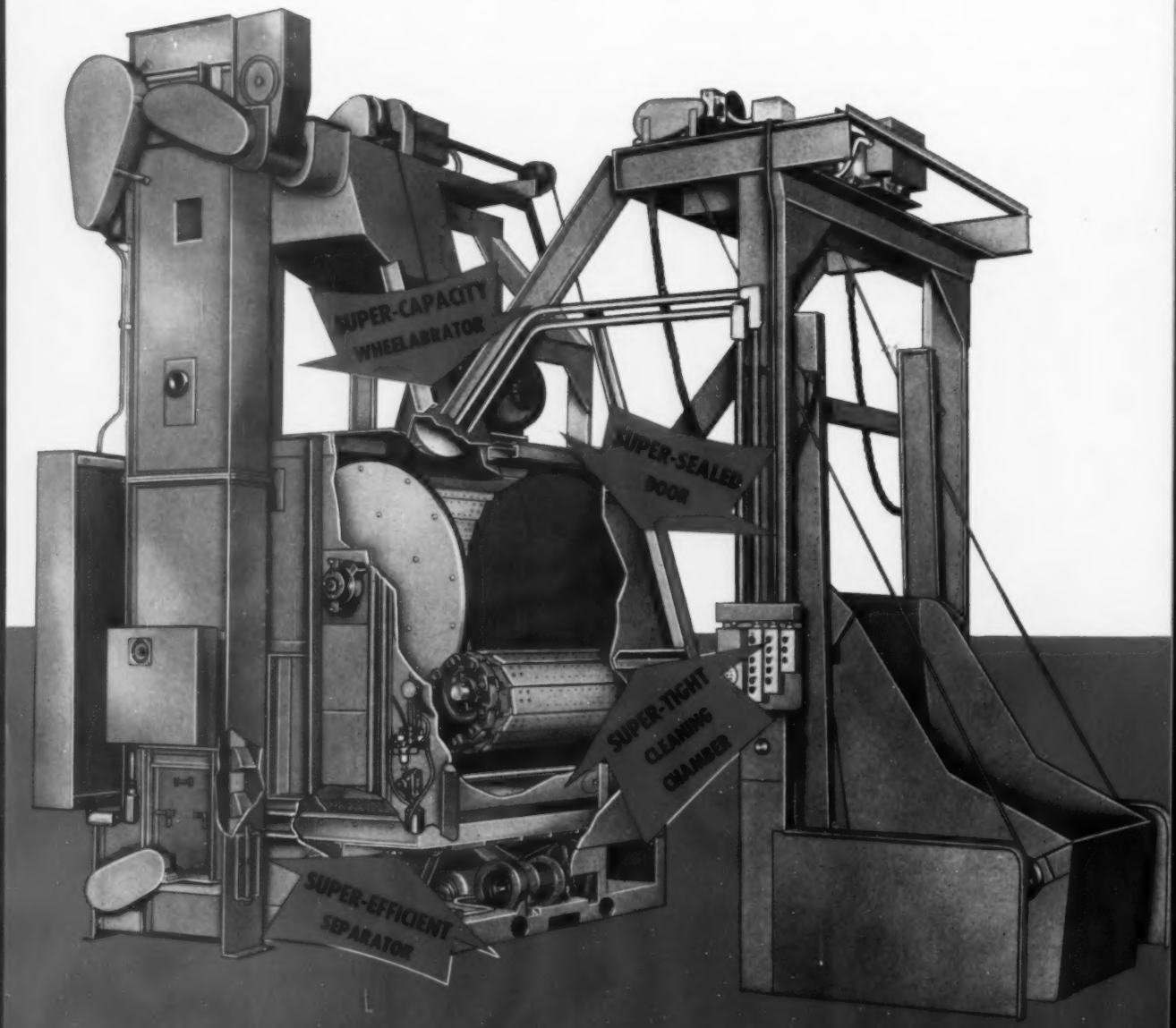
DIFFERENTIAL BEARING SUPPORT – Steel
Three operations from three directions on two parts
492 parts per hour gross – 1 7/10 c per part



KINGSBURY
AUTOMATIC DRILLING AND TAPPING MACHINES
for Low-Cost High Production

WHEELABRATOR SUPER TUMBLAST

NEW AND REVOLUTIONARY



The Super Tumblast is the modern day answer to high priced cleaning costs. It is specifically designed to give you more mileage out of your blast equipment and more profit out of your Cleaning Department. The Super Tumblast is engineered throughout for maximum productivity and maintenance-free operation over extended periods of time. Its trouble-free operation lends itself to automated operation but, whether automatic or manual, the Super Tumblast reduces cleaning costs to a new low level, and pays for itself through operating economies.

pays for itself through SUPER SAVINGS in operating costs

PROVED through FIELD TESTS

in Plants like these:

At Unitcast Corp.

Operated over 6 weeks without wearing out a single part. Saves abrasive, cleaning time, man-hours.

At Dayton Malleable Iron Co. (Ironton Division)

Provides quality cleaning with maintenance, abrasive and labor savings.

At Indiana Forge & Machine Co.

Cleans twice as much work in half the time . . . automatically.

NEW 12-page BROCHURE gives SUPER-TUMBLAST DETAILS. Write today!

New SUPER-CAPACITY Wheel

The New Super-Capacity Wheel throws more than twice as much abrasive as any similar sized wheel previously used. Less power is required per pound of abrasive thrown. The blast pattern is spread over the entire blast chamber in a more uniform manner, providing faster, more uniform cleaning. The wheel has new Long-Lyfe Blades, a strain-proof holding device, a new easy-service wheel guard housing, and a new system of Long-Lyfe wheel guard liners, all designed to reduce maintenance to a minimum.

New SUPER-EFFICIENT Separator

The New Super-Efficient Abrasive Separator is perhaps the greatest single cost-saving feature of the machine because it affects so many areas. It increases cleaning efficiency and speed by maintaining the optimum abrasive mixture throughout the blast cycle. It removes sand and scale in the heaviest concentration without removing abrasive particles, until they are too small for use. By removing highly-abradant contaminants with so much greater efficiency the Super Separator eliminates a major cause of machine wear.

New SUPER-TIGHT Cleaning Chamber

This is the tightest steel flight conveyor ever used in blast equipment. There are no open spaces where even the smallest work can get caught and damaged . . . and there are no areas where work can jam and displace liners, interfere with operation of door, or break the abrasive-tight seal on the machine. This reduces downtime to a minimum.

New SUPER-SEALED Door

The New Super-Sealed Door keeps all abrasive in the machine and provides trouble-free operation on any type of work. The power-operated one-piece door will withstand impacts from both inside and outside the mill. It travels in tracks that are integral with the side frames of the machine. The abrasive seal formed by these tracks is as strong as the basic structure of the machine. The door is reinforced to prevent jamming or warping.

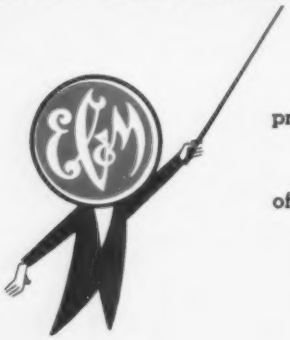
LONG-LYFE Parts throughout

Every high-wear point within the Super Tumblast is equipped with Wheelabrator Long-Lyfe Parts. These parts are made of a patented alloy steel fully heat treated for maximum possible wearable life. They last many times longer than ordinary parts to save hours in replacement time, machine downtime, ordering and handling time.

WHEELABRATOR CORPORATION

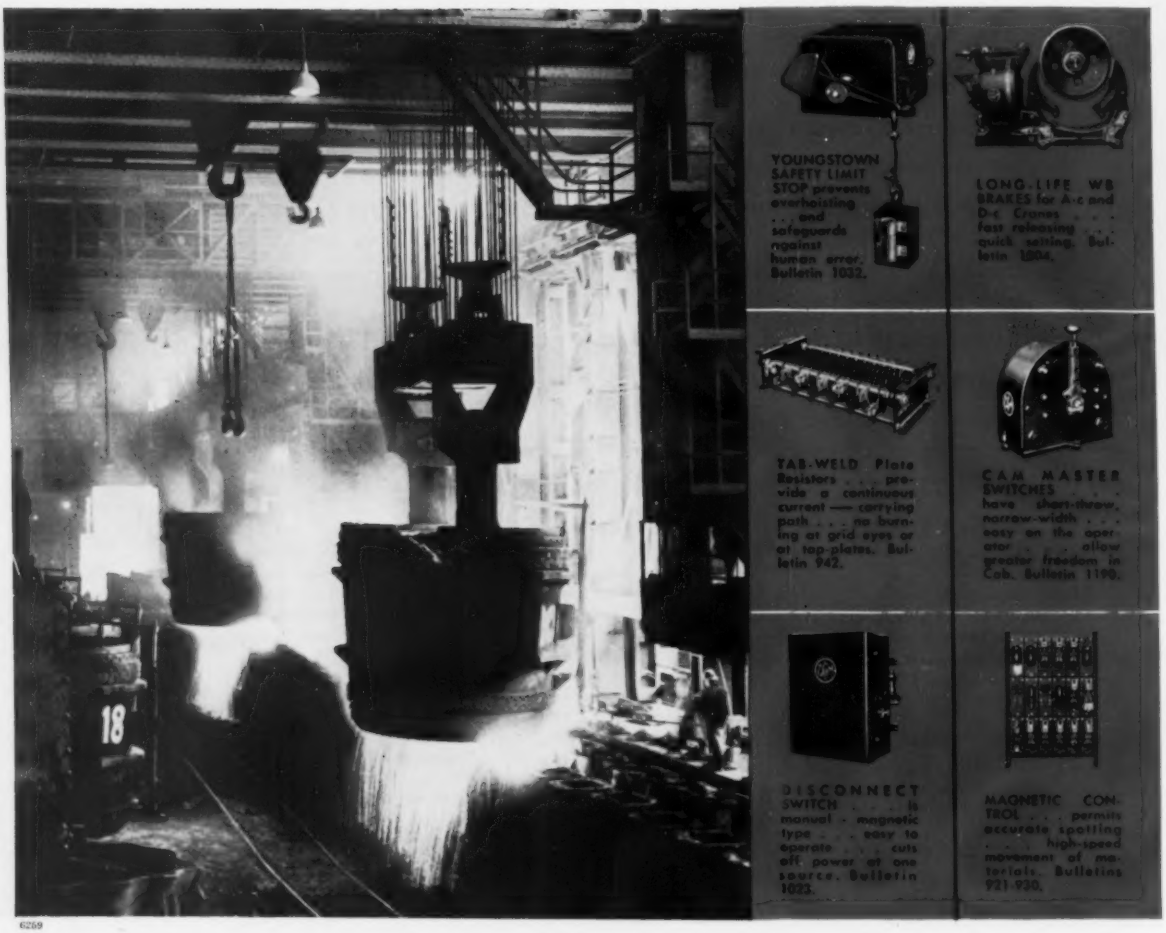
510 South Byrkit Street
Mishawaka, Indiana

Crane Control...engineered to order by EC&M



King size or regular . . . from giant ladle cranes to standard production cranes, EC&M designs the Control equipment specifically for each crane. All control components are engineered and coordinated from the crane data sheet. EC&M uses this method of manufacture to assure precise performance. Operation is smooth . . . response is fast . . . ability to secure accurate inching and quick maneuverability is unsurpassed.

When revamping existing installations or buying new cranes, specify EC&M for complete control . . . control that is engineered to order.

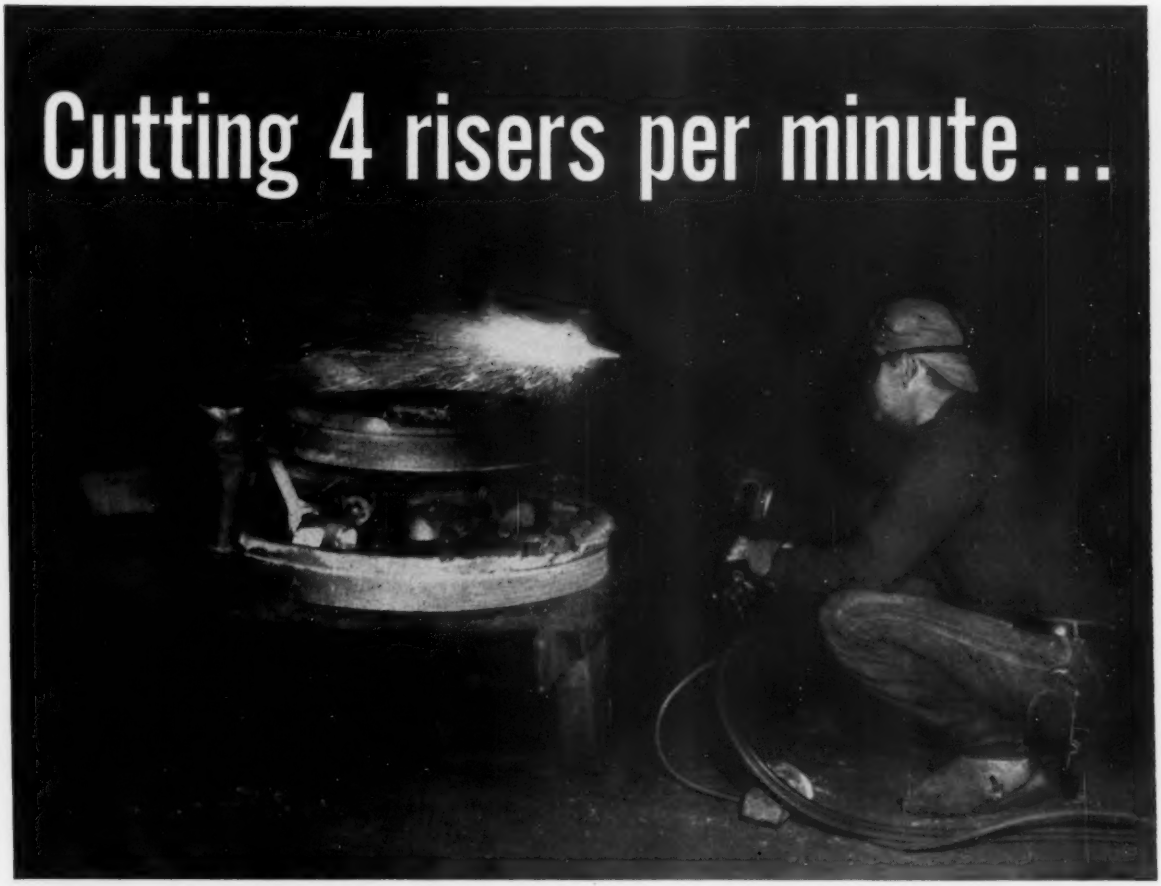


6269

SQUARE D COMPANY

EC & M DIVISION • CLEVELAND 28, OHIO

Cutting 4 risers per minute...



Lightweight and easy to handle, this OXWELD powder-cutting blowpipe makes fast work of risers.

Powder-Cutting speeds removal operations 300%

Removing risers from stainless steel castings need no longer be costly and time consuming. Pictured above is a typical powder-cutting operation at the Ohio Steel Foundry Company, Springfield, Ohio. Here, 2 by 4 inch thick stainless steel risers are removed by powder-cutting in only 15 seconds. By methods previously used, this operation took up to four times longer.

In the powder-cutting process metal powder is automatically injected into an oxygen flame to increase the flame's heat and severing action speed. The powder process is helping users gain new efficiency and speed in the removal of gates and risers, sand incrustations, and casting defects.

The powder-cutting blowpipe used in this operation, an OXWELD AC-4, is designed for hand cutting of oxidation resistant metals such as stainless steel, chrome alloys, and cast iron. Heavier apparatus is also available for manual and mechanized operations.

Increase your production and profit—call your local LINDE representative, or write for illustrated literature on LINDE's modern processes. Start saving now, do it today.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto

Linde Trade-Mark

"Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation

ANTISEP the all-purpose water-soluble cutting base

Cool Profits...when ANTISEP works for you!

"Cool" is the keyword in figuring machine tool profits. And Antisep All-Purpose Base gives you the cooling action of a mountain stream . . . with faster, cleaner cutting, too! Its tough film and extra lubricity insure fast, free cutting on tough metals. Its speedy water cooling takes heat away from tools and works faster than any straight cutting oil could. It is anti-welding, helps prevent chip build-up on tools.

Because this super base is mixed with water, it assures cool operation at maximum speeds and at low cost. Stepped up production, longer tool life, and fewer rejects add up to increased profits for you.

Try Antisep All-Purpose Base in your own plant under your supervision. Call the Houghton Man to arrange a convincing test. Meanwhile, write for the latest Antisep Base bulletin to E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.

ANTISEP ALL-PURPOSE CUTTING BASE

...a product of

E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

For producing the New

CHROMIUM · NICKEL · MANGANESE STAINLESS STEELS

ELECTROMET offers a variety of alloys designed to suit your specific needs

for CHROMIUM

SIMPLEX low-carbon ferrochrome—chromium 63 to 66%, carbon max. 0.010% or 0.025%.

Low-carbon ferrochrome—chromium 67 to 71%, ten carbon grades from 0.02 to 2% max.

Medium-carbon ferrochrome—chromium 66 to 70%, carbon 2.25 to 3%.

High-carbon ferrochrome—chromium 65 to 70%, five carbon grades from 4.5 to 7%.

Low-chromium, high-carbon ferrochrome—chromium 57 to 64%, carbon 3.5 to 5%.

"EM" ferrochrome-silicon—chromium 39 to 41%, silicon 42 to 45%, carbon max. 0.05%.

for NITROGEN ADDITIONS

SIMPLEX nitrogen-bearing, low-carbon ferrochrome—in 2% and 5% nitrogen grades, containing 62 to 65% chromium and 60 to 63% chromium respectively.

Nitrogen-bearing, low-carbon ferrochrome—chromium 65 to 70%, in 0.75%, 1.25%, and 2% nitrogen grades.

Nitrogen-bearing, electrolytic manganese metal—containing approximately 93% manganese (metallic basis) and 6% nitrogen.

for MANGANESE

Electrolytic manganese metal—with minimum manganese content, on a metallic basis, of 99.9%.

Low-carbon ferromanganese—manganese 85% to 90%, six carbon grades from 0.07 to 0.50% max.

MANSILOY alloy—manganese 60 to 63%, silicon 28 to 31%, max. 0.07% carbon.

for additional information

Please contact the nearest ELECTROMET office. Ask for ELECTROMET's new 4-page brochure on electrolytic manganese and the booklets on melting low-carbon stainless steel.

"Electromet," "EM," "Mansiloy," and "Simplex" are registered trade-marks of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
OFFICES: Birmingham · Chicago · Cleveland · Detroit
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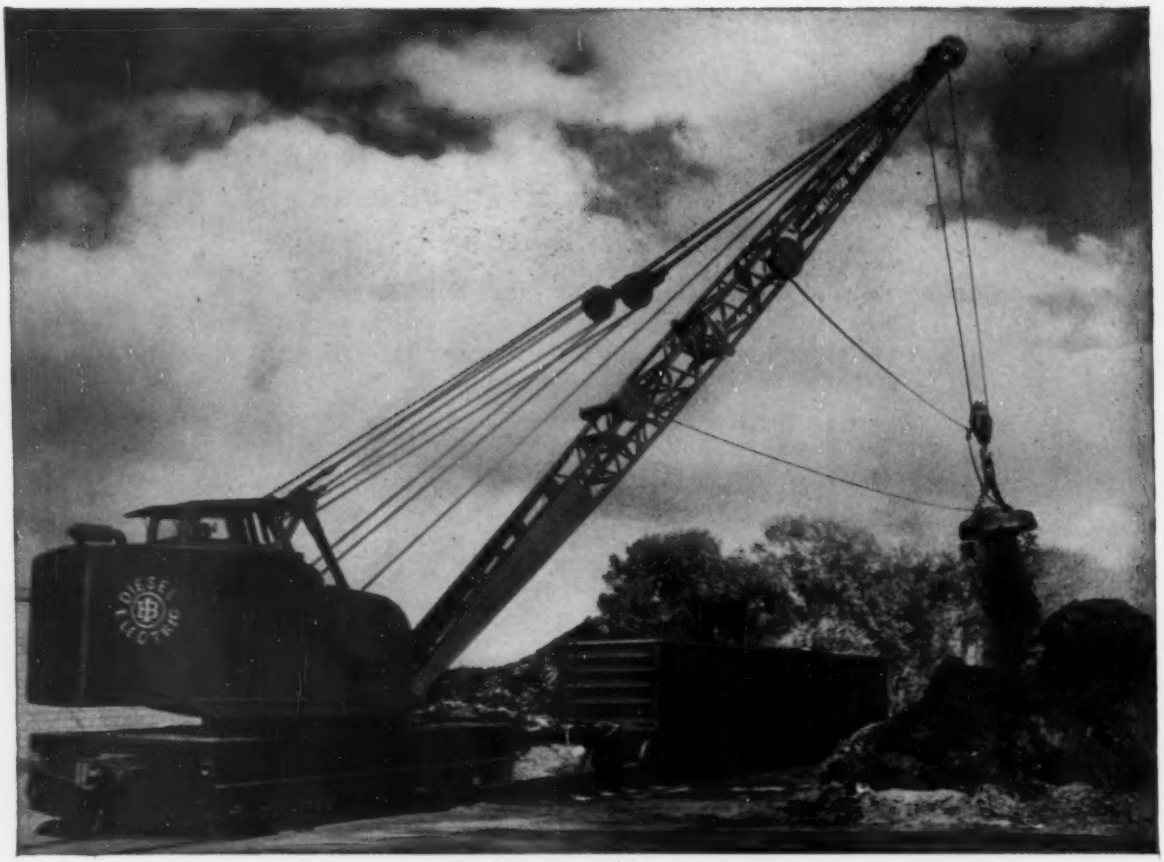


With magnet hook or bucket... BROWNHOIST speeds the job

Brownhoist Cranes are helping maintain high production schedules in mines, steel mills, factories, and scrap yards . . . in fact, wherever there are railroads throughout the world. Brownhoist Diesel-Electric Locomotive-Cranes, for all their husky size, handle easily. Their patented Monitor Type Cab and Clear-Vision Boom give a 360° view. Operating controls are within easy reach. Electric travel permits operation as a switch engine as well as a crane. Constructed to last for many years with little maintenance. Brownhoist Diesel-Electric Cranes are available in capacities from 25 to 100 tons. For complete information, consult your nearest Brownhoist representative or write us today.

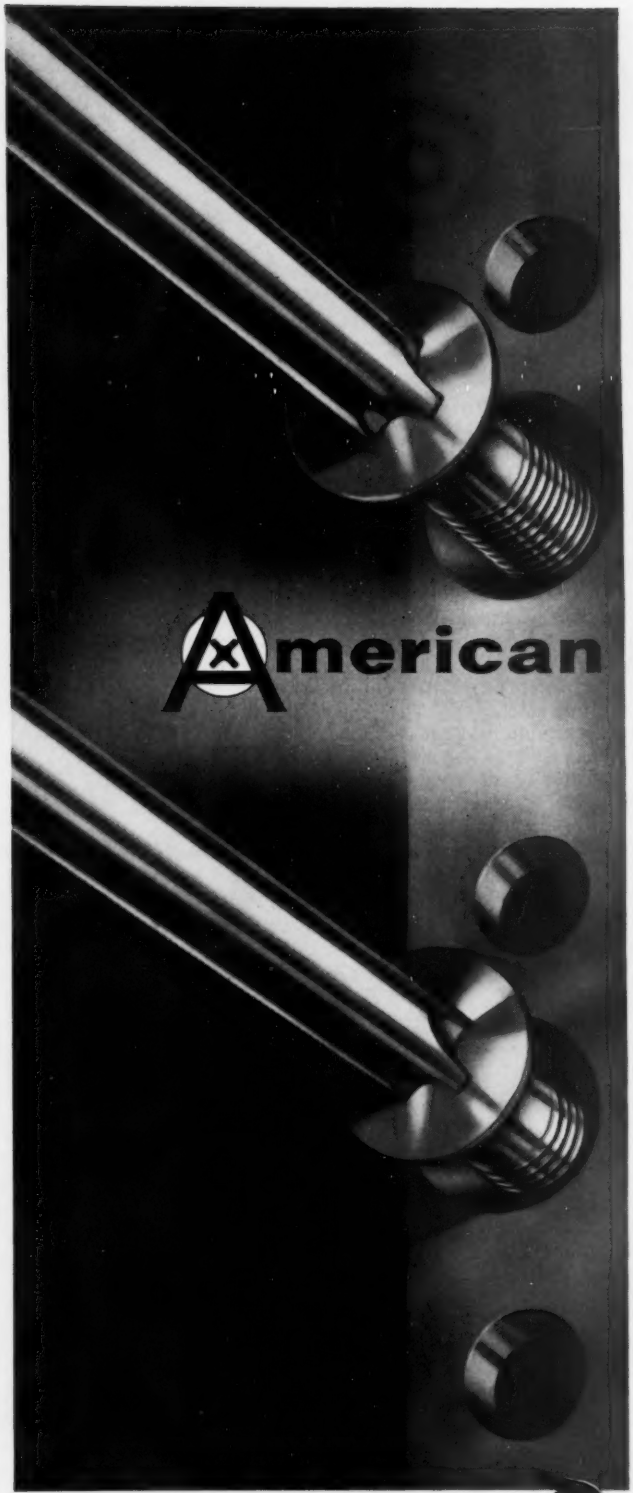
181

BROWNHOIST

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

SUBSIDIARY OF Penn-Texas

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN DISTRICT OFFICES: New York, Washington, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston



They may Seem the same, but...

American is the name!

However you calculate it, your true fastener cost contains four things:

1. price **3. quality**
2. service **4. research**

Occasionally, you may find local price differentials you think may be worth your while. But no one gives you more of all four than American.

AMERICAN GIVES YOU MORE OF ALL FOUR

In service, with a tightly-knit system that meets the needs of the most intricate production lines. Like an appliance manufacturer who uses 120 million American Phillips fasteners a year.

In quality, with a unique quality control program that includes such protection for you as statistical sampling on production runs.

In research, which produced not only the Phillips Head fastener, but showed one customer a substantial saving by converting a three-part, assembled machine screw into a single cold-headed unit.

There are many sources of Phillips-type fasteners. But only at American will you find more of the four basic features you want — price, service, quality, research.

Make your own comparisons . . . send us your inquiry for price and delivery or your specifications for special fasteners. Write:

American!

AMERICAN SCREW CO. • WILLIMANTIC, CONN.
NORRISTOWN, PA. • CHICAGO, ILL. • DETROIT, MICHIGAN

Here's quality in a wide variety . . . and it starts with the basic material

. . . YOUNGSTOWN COLD FINISHED BARS

Lamson & Sessions bolts, nuts and cap screws have established a world-wide reputation as fasteners of quality and dependability. To gain such a reputation is not accidental. It is, rather, the result of careful planning, exact selection of materials and precision manufacturing. The basic material, as an example, is Youngstown Cold Finished Bars.

The uniformly high quality of Youngstown Cold Finished Bars makes possible uniform products. It is a uniformity that starts in the Bessemer or Open Hearth and is maintained throughout manufacture. Composition, structure and surface conditioning combined with "know how" in cold finishing, assure the highest quality. Specify Youngstown - - your best assurance of quality.

QUALITY YOUNGSTOWN SERVICE

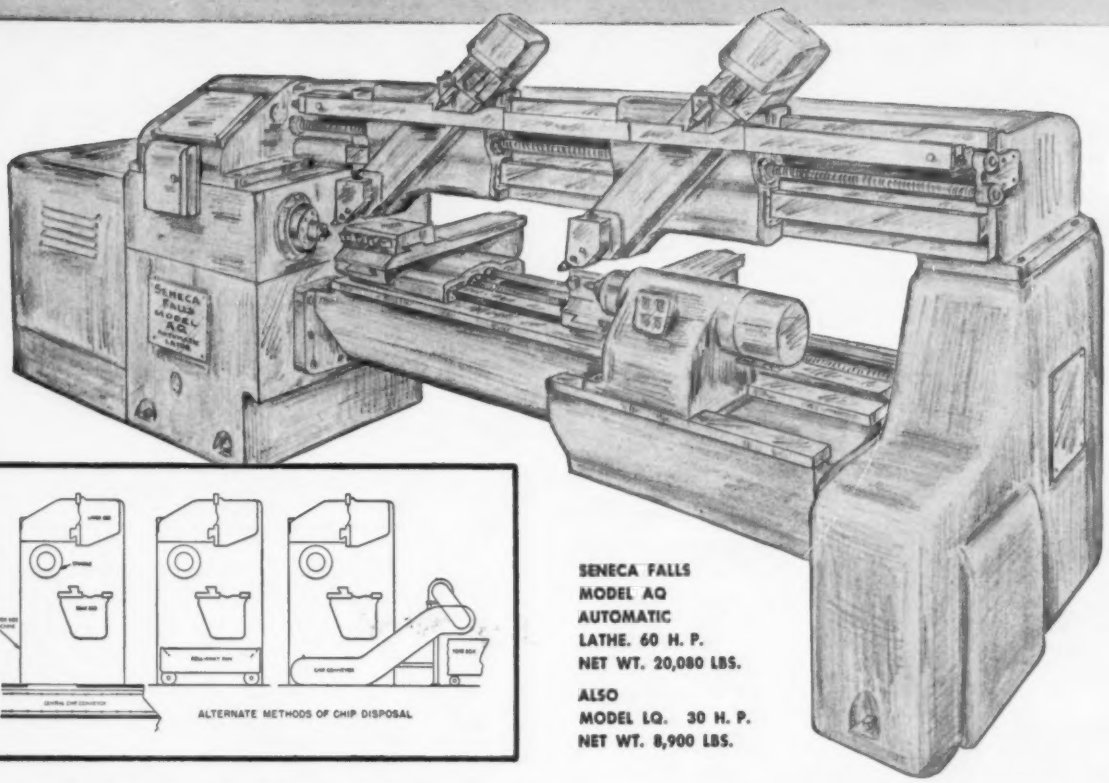
Youngstown COLD FINISHED BARS

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

A BETTER METHOD OF MACHINING REAR AXLE, AND OTHER SHAFTS



ALTERNATE METHODS OF CHIP DISPOSAL

SENECA FALLS
MODEL AQ
AUTOMATIC
LATHE. 60 H. P.
NET WT. 20,080 LBS.

ALSO
MODEL LQ. 30 H. P.
NET WT. 8,900 LBS.

● The new Models LQ and AQ Seneca Falls Automatic Lathes are designed to combine the best and fastest methods of rough and finish turning shafts on a single machine without removing the work and without attention on the operator's part.

The roughing operation is accomplished with multiple tools on a rear carriage while finish turning is done with single, tracer-controlled tools on each of the two overarm carriages. Thus the advantages of multiple tooling for stock removal and single tool tracer turning for accurate finish operations are combined. By this method extremely close tolerances are maintained since the pressure of the single tool is constant over the entire length of the work piece, and full advantage can be taken of the higher cutting speeds now possible with the newer carbide and oxide tool materials.

The machining operation is completely automatic . . . the operator loads shafts between centers and pushes the starting button; multiple tools rough turn; tracer tools then finish turn; and finally the machine stops with all tools returned to starting position.

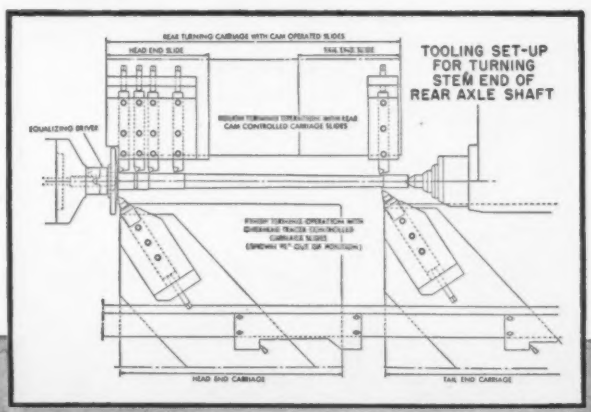
A similar type lathe is used for the flange turning operation. Varying application of multiple tooling or single tracers to either rear or overarm carriages is possible on these lathes and complete "in line" automation can be engineered to specific production requirements,

SENECA FALLS MACHINE CO., SENECA FALLS, N.Y.

WRITE FOR BULLETIN AX 56F

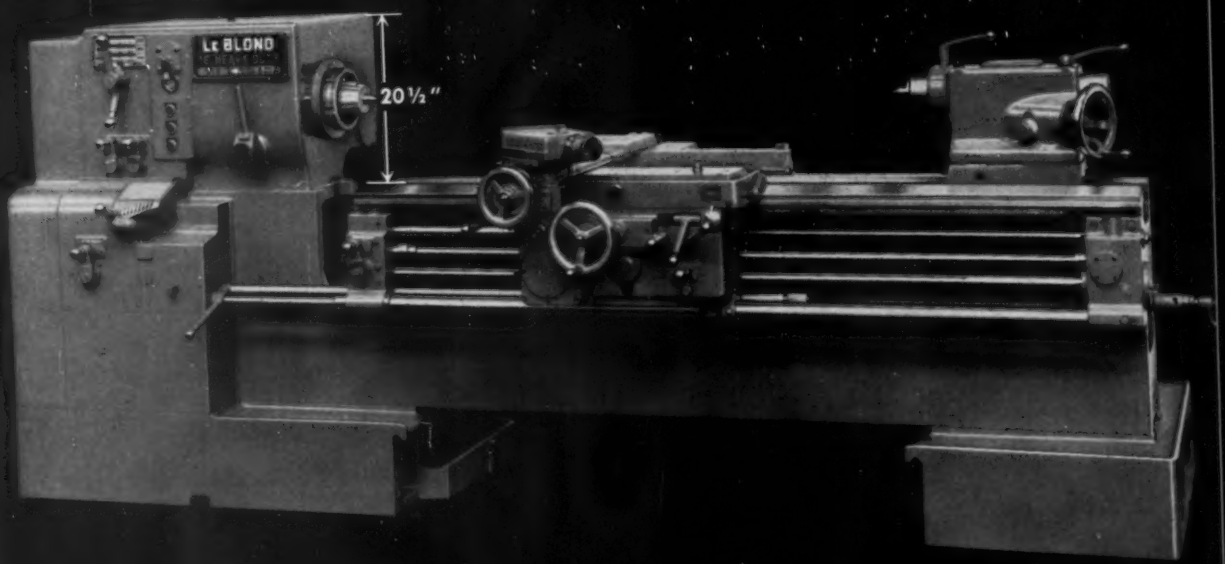
DESIGN FEATURES

- **Simplified changeover features for reduced set-up time.**
- **Feed rate may be automatically changed during cutting cycle.**
- **Streamline design for efficient chip guarding.**
- **Screw feed to all carriages.**
- **Four speed head with automatic change-over.**
- **Large chip flow area.**
- **All templates clear of chip area.**
- **All ways hardened, ground and replaceable.**
- **Open front design facilitates loading and unloading.**
- **Straight line diameter adjustmont for tracer tools . . . no shoulder length change to correct.**

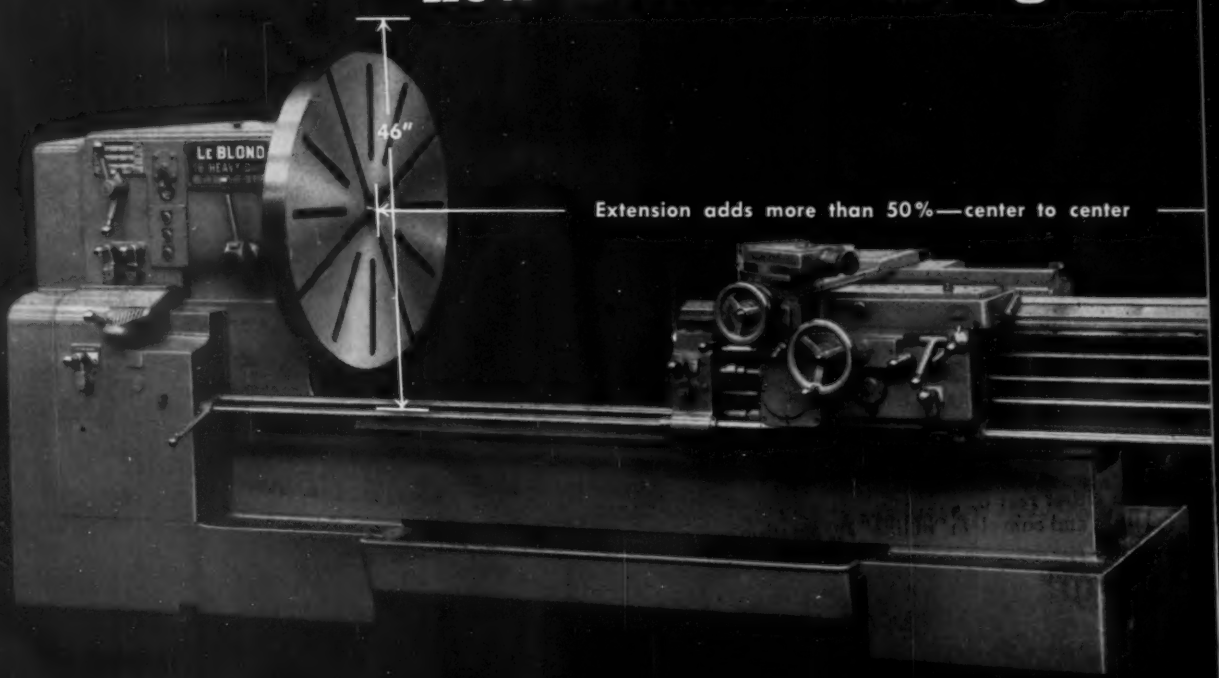


NEW SENECA FALLS
MODEL LQ AND AQ AUTOMATIC LATHES

the lathe that gives versatile a new

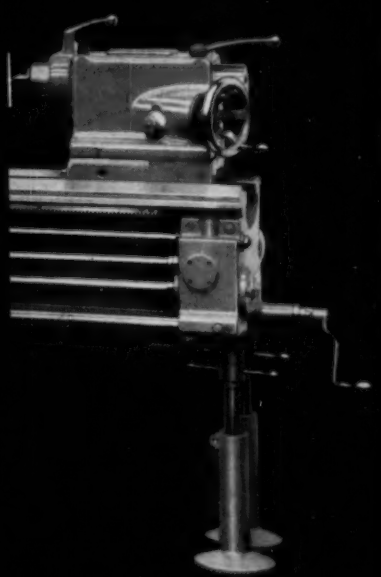


new LeBlond sliding bed



meaning!

gap lathe



Here's a lathe that is fundamentally different. It has a special bed that *slides* open to form a gap—gives you approximately *twice* the normal swing size. Sliding the bed also gives greater bed length, more than 50% greater distance between centers. And, with bed closed it functions as a regular engine lathe.

So, what we mean by a *versatile* lathe is one that actually changes shape to suit your odd-shaped parts. It handles all the usual work, plus a wide variety of large diameter jobs, extra long parts, and combinations of the two. "Swing size" as such is no longer a limitation. For example, here are some of the unusual capacities you can handle on the 16" LeBlond Sliding Bed Gap Lathe:

Face 38" diameters in one cut
Face 45" diameters in two cuts
Turn lengths more than 50% greater than normal center distance
With extension rest (optional): turn 27½" diameter, 13¼" length
With Full-Swing turning attachment (optional):
turn 45" diameter almost full length of gap

Other important features of the new LeBlond 16"/38" SBG Lathe include new spindle bearing design for high-speed turning, combination gear-belt drive headstock, 18 geared speeds, 9 timing belt-driven speeds from 8 to 2000 rpm, spur gear design, four-way rapid traverse, one-piece apron, totally enclosed quick change box, hardened and ground steel bedways, thrust-lock tailstock.

If you have a variety of parts to turn—particularly the unpredictable extremes you encounter in maintenance and job shop work —the LeBlond SBG may well be the answer. An economical answer, too! SBG's come in 4 sizes: 16"/38", 25"/50", 32"/60" Heavy Duties and the 17"/28" Regal. Like all LeBlonds they are built in every engineering detail to give you long dependable service.

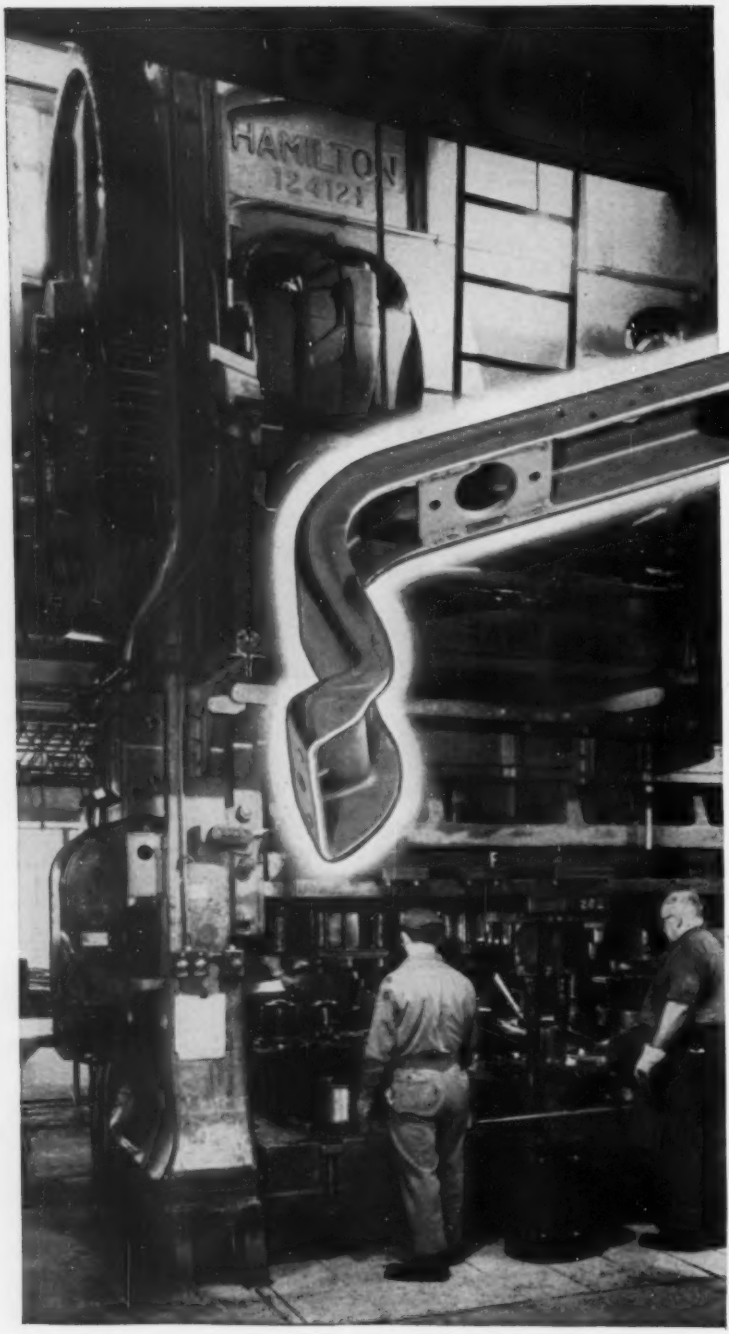
Whatever your turning needs, there's a lathe in LeBlond's complete line to do the job. 76 different models to choose from. Call your LeBlond Distributor or write today.

. . . cut with confidence

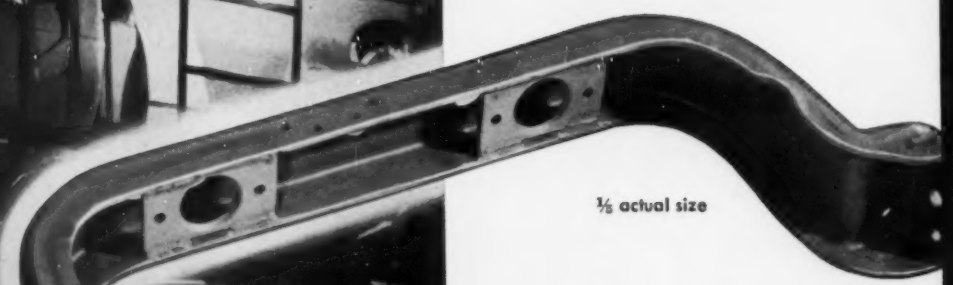
LeBLOND
of Cincinnati

THE R. K. LEBLOND MACHINE TOOL COMPANY
CINCINNATI 8, OHIO

World's largest builder of a complete line of lathes for more than 69 years



Use Republic's BETTER



½ actual size

Actual size

SIZE RANGE OF STAMPINGS produced by Republic's Pressed Steel Division contract facilities is indicated by truck cross member engine support and window sweep lock shown above. In addition to stampings, we can complete your parts or products requiring the following operations: gas, arc, spot, projection, seam, stitch, butt and submerged arc welding; controlled atmosphere, conveyor-type copper brazing; rotary hearth and conveyor-type annealing; machining, including drilling, tapping, milling and turning; spray or dip painting, 3-color lithographing plus infra-red or gas drying; hot dip galvanizing; hot, press, spinning or semi-tubular riveting.

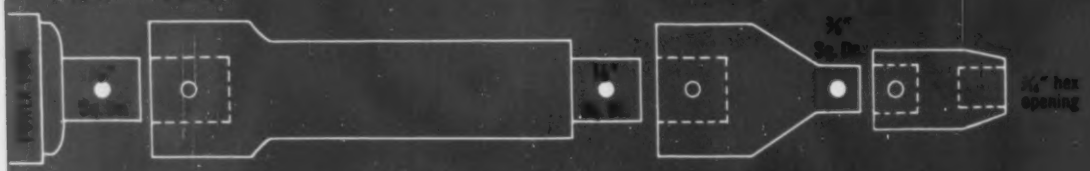
REPUBLIC

REPUBLIC STEEL

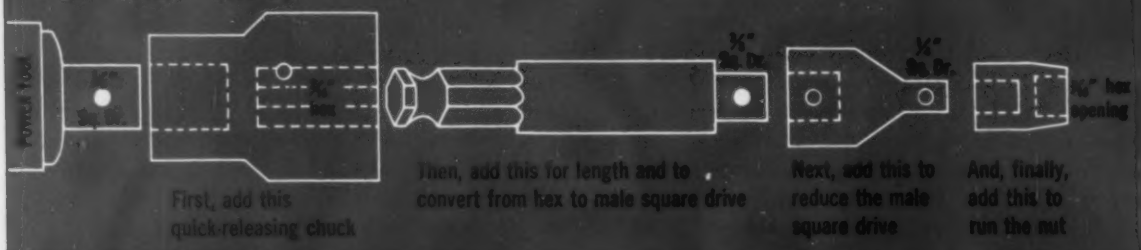
World's Widest Range of Standard Steels

are you running nuts and cap screws the hard way?

like this?

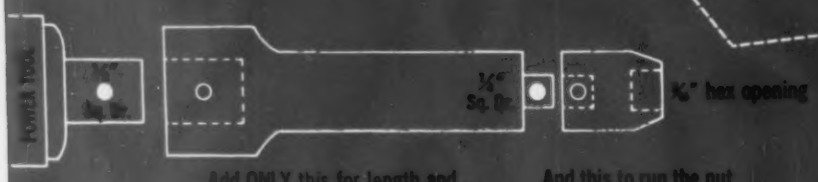


or like this?



then switch to APEX . . . *the easy way!*

like this!



Apex extensions are stocked in any combination of sizes, Female Square to Male Square, or Male Hex Drive to Male Square.

The easiest, most efficient and least expensive way to run nuts on production or maintenance work is with Apex nut running tools, designed and built to meet your requirements.

When you need extra length, for example, Apex stocks a full line of extensions to fit your tool anvils and accessories, regardless of the combination of types and sizes. Apex extensions bring power closer to the work, eliminate unnecessary tooling and extra connections that cause backlash and loss of power. Available in short and standard lengths, and in long lengths in increments of one inch. ¾", 1", 1 ½" and 2 ½" square drive extensions are offered with ball lock or cross pin hole; other sizes and types are available with ball lock or pin lock. Extensions are just one part of the complete Apex line of nut running tools described in Catalog 29-R. Write, on your company letterhead please, for your copy.

Ask **APEX** *for the answer to your nut running problem!*

THE APEX MACHINE & TOOL COMPANY

1029 S. Patterson Blvd. • Dayton 2, Ohio

The gears in an automatic nut former have to be tough and strong to withstand heavy, varying loads. Yet, the castings from which they're made should be easy to machine. That's why this gear for a Waterbury Farrel Automatic Nut Former is made from ASTM-50 gray iron with a nominal composition of 1% nickel and .50% molybdenum.

Moly gives cast iron gears higher strength with toughness and good machinability

"To insure a tough, easily machined gray iron for the gears in our Automatic Nut Formers," says Henry C. Griggs, Metallurgist for Waterbury Farrel Foundry & Machine Co., "we specify .50% molybdenum in our ASTM-50 material. The properties of this material contribute importantly to the reputation of Waterbury equipment for accuracy and high speed production under severe operating conditions."

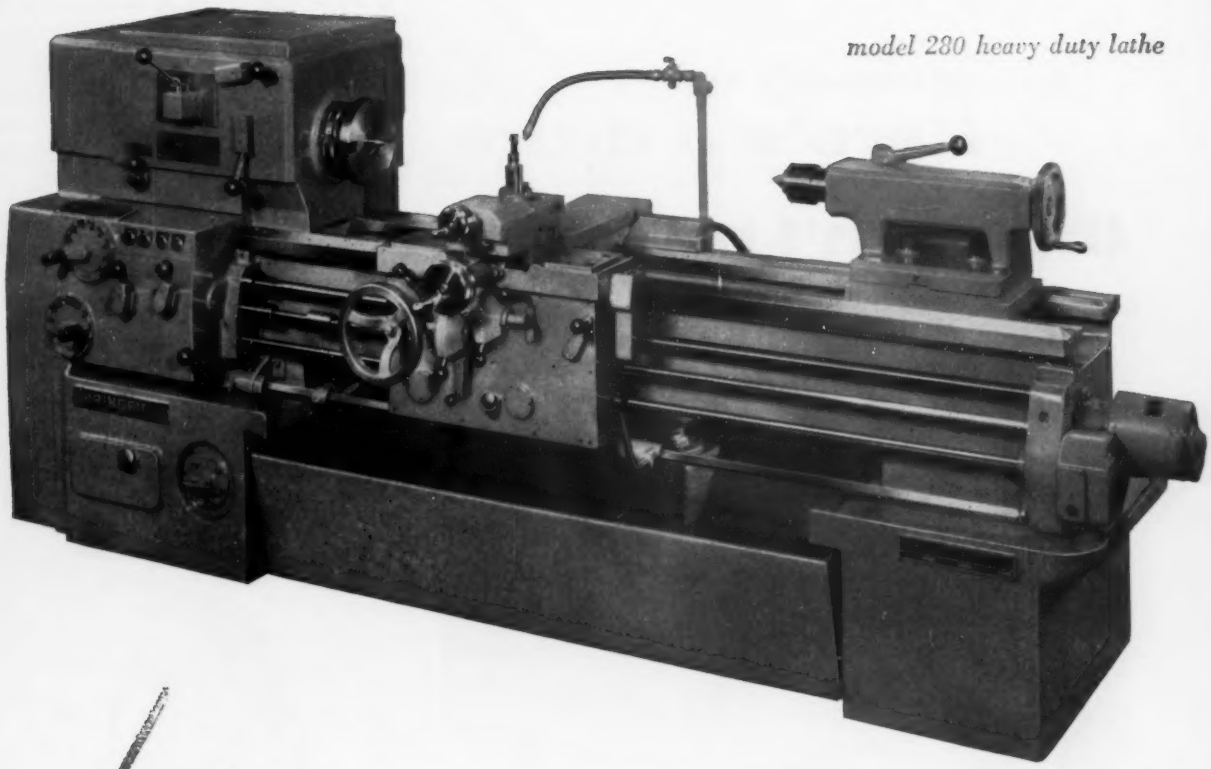
Molybdenum helps to give reliable and reproducible castings – very important factors in consistent performance of gears.

Investigate moly irons. They may be the key to better performance in many of your gear applications.

For the first two in a series of bulletins, "Why Moly Iron," or for technical assistance, write Climax Molybdenum Co., Department 2, New York 36, N. Y.

CLIMAX MOLYBDENUM


SPRINGFIELD



model 280 heavy duty lathe

it does more work for less money

Springfield is proud to present a new heavy-duty 16″ engine lathe, the Model 280. It offers high horsepower—10, 15 or 20 hp—for heavy cuts, clean design, and ease of operation, all at a reasonable price. Direct simplicity and straightforward design assure low maintenance cost.

It has no electronic brain, because Springfield believes that most of today's jobs still require craftsmanship of the human variety. In the Model 280 the price is for the tool, not the brain.

Only the gears necessary for a given speed are in mesh. Sixteen speeds to choose from, 60 feeds and threads—available instantly to any operator. Unique sealed oil spray lubricates and cools gears. It's the lathe most easily converted to contouring and reproducing with accessories, without budget strain. If you're in the quality market for a new heavy-duty lathe that still respects the contribution of craftsmanship, the Model 280 is for you. Basic price FOB Springfield, Ohio, $8,013.

The Springfield Machine Tool Company
Springfield, Ohio

65TH YEAR OF BUILDING IDEAS INTO MACHINE TOOLS

SPRINGFIELD

Here's a drum that can't be beat!

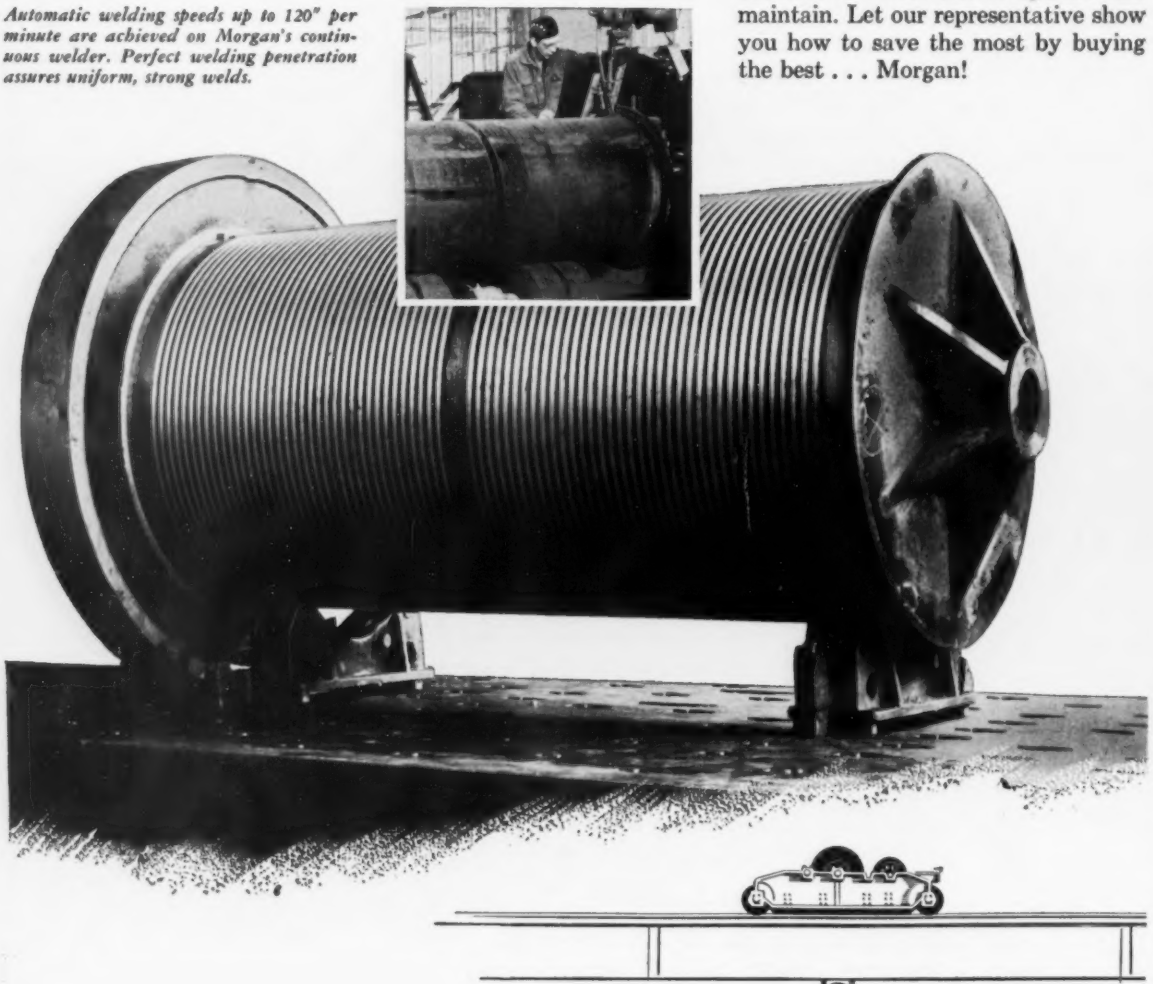
• *Fabricated drums* in Morgan cranes are structurally stronger than cast drums . . . yet they weigh less.

Automatic welding of Morgan drums with the world's largest continuous welding machine assures uniform, sound joints and seams.

Crane girders, too, are welded automatically, making them stronger and lighter. Morgan welders are qualified in accordance with A.S.M.E. and A.W.S. codes.

Performance records prove conclusively that Morgan cranes are the best in the business . . . cost less to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!

Automatic welding speeds up to 120" per minute are achieved on Morgan's continuous welder. Perfect welding penetration assures uniform, strong welds.



The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, open hearth special cranes, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

THE MORGAN ENGINEERING CO. *Alliance, Ohio*

If You Buy Acids or Other Chemicals in Tank Car Loads···

You Need this Valuable Information On Tank Car Unloading

Here's valuable, time-saving information on unloading various types of tank cars . . . available free from General Chemical's technical library. If you buy any of the chemicals listed in tank car quantities, these information-packed bulletins are a "must" for you.

HERE'S WHAT'S AVAILABLE

"Unloading Steel Tank Cars"
Chemicals covered: Electrolyte, Hydrofluoric Acid (Aqueous), Mixed Acid or Nitrating Acid, Oleum, Spent Acid, Sulfuric Acid, and Fluosulfonic Acid

"Unloading Rubber-Lined Tank Cars"
Chemicals covered: Liquid Alum, Aluminum Chloride, Muriatic Acid, and Phosphoric Acid

"Unloading 'Non-Regulatory' Liquid Chemicals from Tank Cars"
Chemicals covered: Aqueous Ammonia, Lime Sulfur Solution, Sodium Silicate Solution, and Sodium Sulfide, Liquid

"Unloading Nitric Acid from Tank Cars"

"Unloading Anhydrous Hydrofluoric Acid from Tank Cars"

"Unloading Sulfan* (Stabilized Sulfuric Anhydride) from Tank Cars"

HERE'S HOW YOU CAN GET THESE TANK CAR UNLOADING BULLETINS

Just fill in and mail the coupon at right, checking the information you're interested in receiving. Bulletins desired will be sent promptly and without any obligation.

*Reg. U.S. Pat. Off.

Allied Chemical

Basic Chemicals for American Industry

GENERAL CHEMICAL DIVISION, ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Please send your free tank car unloading bulletins checked below.

- ☐ Unloading Steel Tank Cars
- ☐ Unloading Rubber-Lined Tank Cars
- ☐ Unloading "Non-Regulatory" Liquid Chemicals from Tank Cars
- ☐ Unloading Nitric Acid from Tank Cars
- ☐ Unloading Anhydrous Hydrofluoric Acid from Tank Cars
- ☐ Unloading "Sulfan" (Stabilized Sulfuric Anhydride) from Tank Cars

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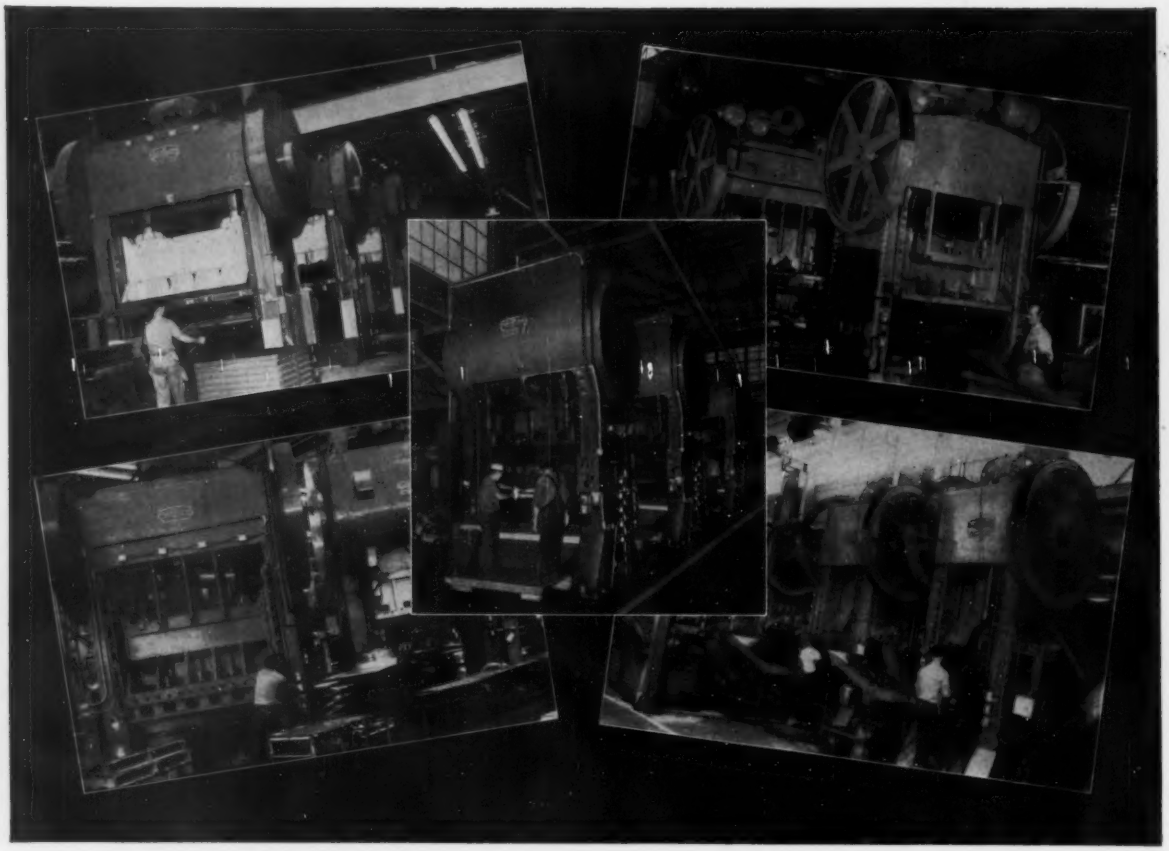
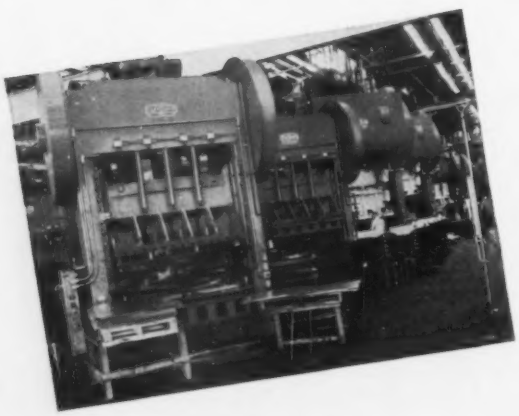


new CLEVELAND Presses give you better stampings for less.



Chances are that your production lines are operating at full capacity. That's why it's most important to carefully check your present Press equipment. Worn, inefficient Presses are wasting your profits.

In the ever widening field of pressed metal products, new Cleveland Presses are used to advantage by cost conscious manufacturers. They've found their investment in new Presses is soon repaid by more accurate, dependable and economical production.

Whether you need one press or a complete battery, you'll find there's just the right Cleveland Press to keep your company in a competitive, profitable position; Cleveland Presses are built in a complete range of types and sizes, from small Open Back Inclinables to large Underdrives. All offer outstanding efficiency.

Whatever your needs may be, "why settle for less than a Cleveland Press". Be sure to get complete information on the (patented) Cleveland Drum Type Air Friction Clutch with spring loaded Brake. It reduces down-time. Write or call today.

THE CLEVELAND PUNCH & SHEAR WORKS CO.

Established 1880

POWER PRESSES – FABRICATING TOOLS

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CITY FOUNDRY DIVISION · SMALL TOOL DEPARTMENT

World's Largest Power Shovel

As tall as a 16-story building, it carries a 60-cu.-yd. bucket. It can handle 90 tons of overburden at one bite, pile it 290 feet away to a height of 100 ft., and swing back for another load . . . all in 45 seconds.

Able to remove earth and rock overburden averaging 90 ft. in depth, this gigantic shovel known as THE MOUNTAINEER, opens up a reserve of millions of tons of coal not removable with smaller machines.

Built by Marion Power Shovel Company for Hanna Coal Company Division of Pittsburgh Consolidated Coal Company, it weighs 5,500,000 lbs., can handle 13 million pounds of material an hour. It cost $2,600,000.

USS Special Steels help to keep it working around-the-clock, all year 'round.

USS

USS Special Steels help to working around-the-clock,

TO pay off on the more than two-and-a-half million dollars invested in it, THE MOUNTAINEER must operate continuously—24 hours a day, 7 days a week, every month in the year. It costs approximately $1,000 per hour for any shutdown.

That's why the engineers of the Marion Power Shovel Co. were so careful in the selection of the steels used in vital parts of this monster machine. So far as was humanly possible they had to build to eliminate any chance of structural failure. As a result, they turned to extensive use of USS Special Steels—steels that had proved their ability to withstand the rigors of uninterrupted operation in previous Marion shovels of very large size.

USS "T-1" Steel adds strength and durability in dipper, dipper stick, bail, and crowd rack

Tremendous stresses are concentrated in these vital parts of THE MOUNTAINEER. Not only must they handle the largest loads ever imposed on a shovel, but they also must be able to withstand the destructive, incessant stress of high-speed, continuous operation. USS "T-1" Steel was selected to assure the longest possible service without breakdown.

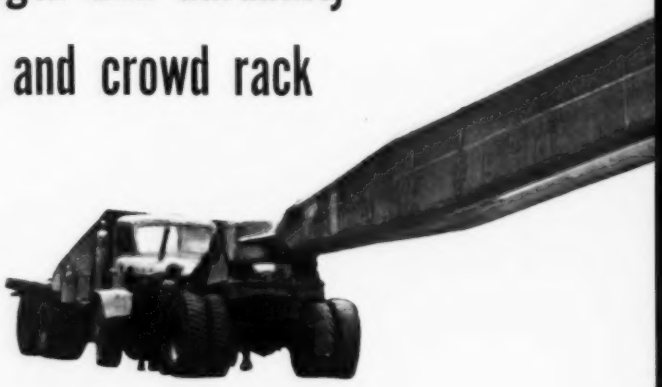
Marion Power Shovel engineers know from their own past experience how good "T-1" Steel is. They have been using it ever since 1951 when USS "T-1" Steel was developed, with their and Hanna's cooperation, for use in a 46-cu.-yd. shovel. That 46-cu.-yd. shovel was then the world's largest.

Since then, Marion has considerably increased the maximum size of power shovels to meet new requirements. In each new and larger dipper, as in the rugged, new MOUNTAINEER, USS "T-1" Steel has enabled them to boost capacity without an increase in weight.

Marion engineers have used "T-1" Steel for its great yield strength of 90,000 psi. They have used it for its extraordinary toughness and resistance to impact damage at sub-zero temperatures. Most important, they have used it for its excellent weldability, which enables them to reduce fabricating costs.

USS "T-1" Steel has performed so well for them, that they expect to use it again in new, even larger dippers which they will build soon.

USS "T-1" Steel's unique combination of properties is finding wide application not only in mining and construction equipment, but also in bridges, TV towers, and other heavy-duty products. You can probably use it to advantage. Call or write United States Steel for complete information.



In this massive 60-yard bucket, USS "T-1" Steel saved approximately 40 tons of dead weight, compared to the weight of conventional cast buckets of the same capacity. USS "T-1" Steel also makes repairs less costly, because it can be welded in the field.

Used in boom and crowd handle,

USS TRI-TEN "E" Steel ensures continuous operation

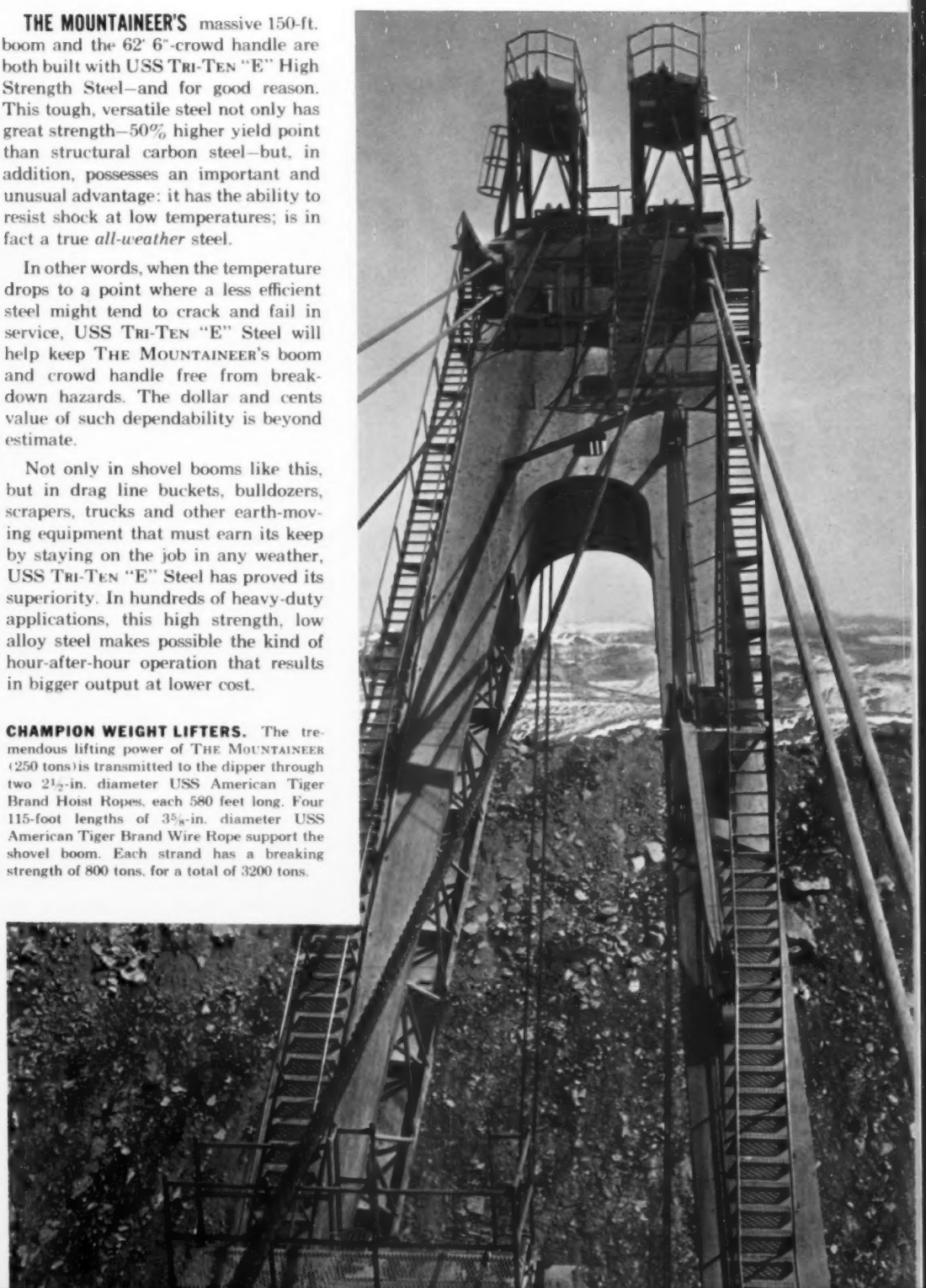
. . . in any climate

THE MOUNTAINEER'S massive 150-ft. boom and the 62' 6"-crowd handle are both built with USS TRI-TEN "E" High Strength Steel—and for good reason. This tough, versatile steel not only has great strength—50% higher yield point than structural carbon steel—but, in addition, possesses an important and unusual advantage: it has the ability to resist shock at low temperatures; is in fact a true *all-weather* steel.

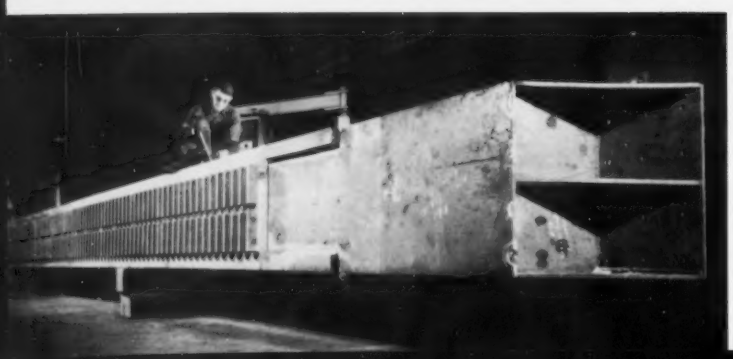
In other words, when the temperature drops to a point where a less efficient steel might tend to crack and fail in service, USS TRI-TEN "E" Steel will help keep THE MOUNTAINEER'S boom and crowd handle free from break-down hazards. The dollar and cents value of such dependability is beyond estimate.

Not only in shovel booms like this, but in drag line buckets, bulldozers, scrapers, trucks and other earth-moving equipment that must earn its keep by staying on the job in any weather, USS TRI-TEN "E" Steel has proved its superiority. In hundreds of heavy-duty applications, this high strength, low alloy steel makes possible the kind of hour-after-hour operation that results in bigger output at lower cost.

CHAMPION WEIGHT LIFTERS. The tremendous lifting power of THE MOUNTAINEER (250 tons) is transmitted to the dipper through two 2½-in. diameter USS American Tiger Brand Hoist Ropes, each 580 feet long. Four 115-foot lengths of 3⅝-in. diameter USS American Tiger Brand Wire Rope support the shovel boom. Each strand has a breaking strength of 800 tons, for a total of 3200 tons.



keep THE MOUNTAINEER day after day, all year 'round



The 42-foot crowd rack is fabricated from seven lengths of 6½"-thick USS "T-1" Steel. Gear teeth were machined in it to a depth of three inches—almost half the total thickness of the steel. Under this condition, the "T-1" Steel had to be of extremely high quality—sound, strong, and tough—to withstand constant severe impact loads. The machined rack sections were then quenched and tempered. Marion had no difficulty flattening, finish-machining, or welding this very high strength alloy steel.

USS Quality Forging jack cylinders were forged from weldable alloy steel

As you can see from the picture, the shovel rests on four track assemblies. When it proceeds into a wall of overburden or coal, the shovel is *automatically* maintained on an even keel by means of a level-sensitive device that transmits signals to hydraulic equipment that controls each of the four jack cylinders.

To assure absolute reliability, a USS Quality Forging was used for each cylinder. An ingot of alloy steel was pierced; then the resultant cylinder was hot-worked over a mandrel to develop a dense, tough cylinder wall with maximum strength.

To top it off, a weldable alloy steel was used for the jack cylinder forgings. This eliminated stress-sensitive lugs or brackets, and permitted Marion to weld the cylinders into the superstructure of the shovel.

USS Quality Forgings are widely used for heavy machinery parts, rolls, sleeves and shafts. They can be made from carbon, alloy or stainless steels. *Complete* heat treating and test facilities are available. Write for our free, 32-page Forgings booklet.

USS

UNITED STATES STEEL

For STEEL and STEEL PRODUCTS that meet today's needs and anticipate tomorrow's

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General Offices: 525 William Penn Place, Pittsburgh 30, Pa.—Manufacturers of ingots, blooms, billets and slabs; bars; plate; sheet and strip; tin plate; sketch plates and structural shapes; CB sections; bearing piles and steel sheet piling; floor plate; wheels, rails and track materials; special trackwork and accessories; mine and industrial cars; commercial forgings for heavy machinery of all types; liner plates and grinding balls; Lorig Aligner rolls and pulleys; USS Stainless and Heat Resisting Steels; USS Carilloy Alloy Steels; USS "T-1" Constructional Alloy Steel; USS High Strength Steels.

AMERICAN STEEL & WIRE DIVISION

General Offices: Rockefeller Building, Cleveland 13, Ohio—Manufacturers of Wire and Wire Products—wire fencing, barbed wire, baling wire; steel posts; wire rope; aircraft control cables; rail bonds and signal bonds; telephone wire and strand; electrical wires and cables; cold rolled strip; springs and spring wire; manufacturers wires; highway guards; concrete reinforcement; nails, tacks and staples. USS Stainless and Heat Resisting cold rolled strip, wire and wire products and USS High Strength Steel products.

CYCLONE FENCE DEPARTMENT — General Offices: Waukegan, Ill.—Manufacturers of chain link and lawn fencing; fence gates and posts; wire partition work; wire baskets; chain link and flat wire belting; wire screen cloth, wire hardware cloth.

NATIONAL TUBE DIVISION

General Offices: 525 William Penn Place, Pittsburgh 30, Pa.—Manufacturers of seamless and welded wrought tubular products (in plain, carbon and in all alloy steels applicable to pipe and tubing); standard, extra strong and double extra strong pipe; boiler and superheater tubes; still tubes; condenser and heat exchanger tubes; drill pipe, casing, tubing, drive pipe, line pipe; large OD pipe; pipe piling; line poles, flag poles, masts and booms; cylinders, gas bottles, miscellaneous pressure containers; mechanical tubing, aircraft tubing, alloy tubing; miscellaneous tubular forgings. USS Stainless Steel pipe and tubes. Also plastic (polyethylene) pipe.

TENNESSEE COAL & IRON DIVISION

General Offices: P. O. Box 579, Fairfield, Ala.—Manufacturers of semi-finished steel; structural shapes; sheared and universal plates; merchant bars, concrete bars; hot and cold rolled sheets; flat and formed galvanized sheets; strip; cotton ties; tin mill products; rails, axles and track materials; forgings and castings; wire, wire rods, woven fence, barbed wire, bale ties; nails and staples. Southern distributors of products of other manufacturing divisions of United States Steel.

COLUMBIA-GENEVA STEEL DIVISION

General Offices: Russ Building, San Francisco 6, Calif.—Manufacturers of iron and semi-finished steel; billets, structural shapes; sheared plates; hot rolled bars, sheet and strip; cold reduced sheets; galvanized sheets; tin plate and tin mill products; wire rods; high and low carbon wire; bright and galvanized wire; wire rope and strand; barbed wire and fence; baling wire; nails and staples. Western distributors of products of other manufacturing divisions of United States Steel.

U.S. STEEL SUPPLY DIVISION

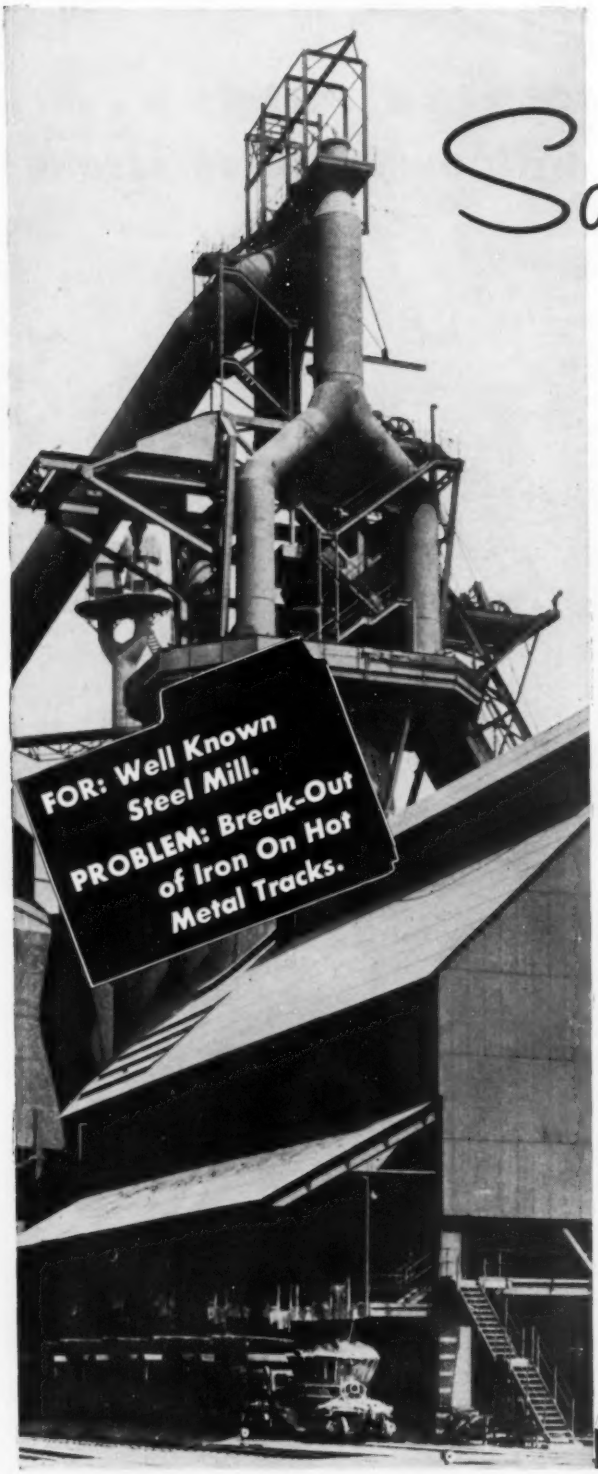
General Offices: 208 So. La Salle Street, Chicago 4, Ill.—Operates warehouses from coast-to-coast, carries in stock for immediate shipment hundreds of varieties and sizes of steel and steel products. Material is available in standard warehouse lengths and sizes, or can be cut to customer requirements.

UNITED STATES STEEL EXPORT COMPANY

General Offices: 30 Church Street, New York 8, N. Y.—Export distributor for all steels and steel products manufactured by United States Steel.

Printed in U.S

CHICAGO CONCRETE ON THE JOB IN HOURS



Saved

40 HOURS OF PRODUCTION

"WE THOUGHT OUR FURNACE WOULD BE OUT OF PRODUCTION AT LEAST 2 DAYS . . . BUT WITHIN TWO HOURS AFTER THE BREAK-OUT CHICAGO CONCRETE WAS ON THE JOB . . . AND IN 24 HOURS WE WERE BACK IN FULL PRODUCTION," so commented the superintendent of blast furnaces at a well-known steel mill. It is another story typical of the speed that CHICAGO CONCRETE is capable of — speed that has saved customers thousands of dollars. This is the story:

At 11 P.M. we received an emergency call . . . a break-out of iron on the hot metal tracks had burned up the tracks and welded a number of railroad trucks to them. By 1 A.M. the first CHICAGO CONCRETE men were on the job. In 8 hours they had the spill cleaned up and new tracks laid. Four sets of railroad trucks were saved from the scrap-heap by the careful use of dynamite . . . a service that CHICAGO CONCRETE are experts at.

On the job faster . . . with experienced skilled personnel . . . employing the most modern equipment . . . that is CHICAGO CONCRETE'S story. You, too, can depend on CHICAGO CONCRETE in any emergency.

CHICAGO CONCRETE BREAKING CO.

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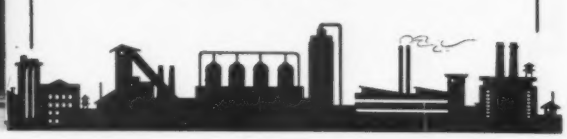
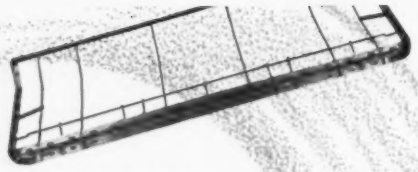
AND NOW

CHICAGO CONCRETE CONSTRUCTION COMPANY offers a complete industrial construction service . . . handling anything from minor masonry, steel or foundation repairs to complete furnace rebuilds.



SERVING THE PRIMARY METALS AND OIL INDUSTRIES WITH KNOW HOW, EQUIPMENT AND MANPOWER FOR 35 YEARS



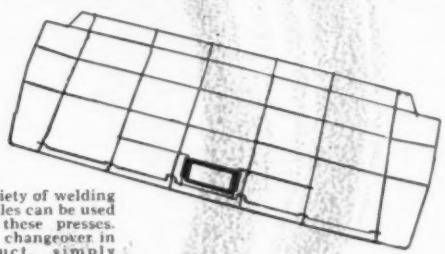
FEDERAL WELDING PRESS . . .

a complete seat frame with every press stroke!

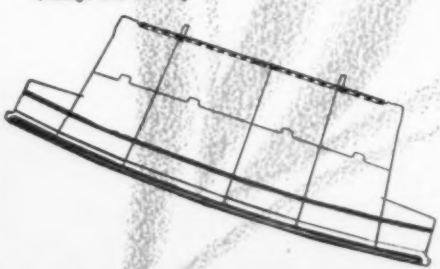
Frames for automobile seat backs and cushions are being resistance welded on Federal Welding Presses at the Great Lakes Spring Division of Rockwell Spring and Axle Co.

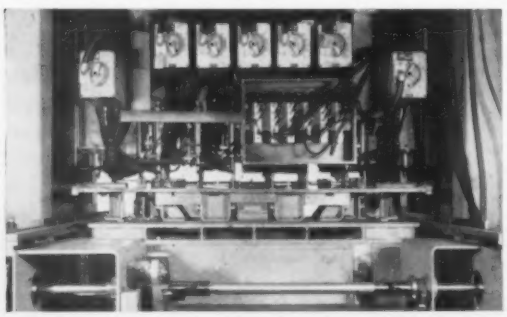
Only Federal can offer single company responsibility in supplying both the mechanical welding press and the welder tooling based on their long experience in both press (Warco) and resistance welder (Federal) manufacture.

There are many manufacturing operations existing today where a mechanical welding press would pay dividends. If you have one of them, why not contact the one company best suited to provide the answer? That's *Federal — First in Resistance Welding.* Welding Press brochure on request.



A variety of welding capsules can be used with these presses. For a changeover in product, simply change the tooling.





Close-up view of welding capsule.

There's no comparison between the old single weld method and this "automated" production line made possible through the Federal Welding Press.

Federal® WELDERS

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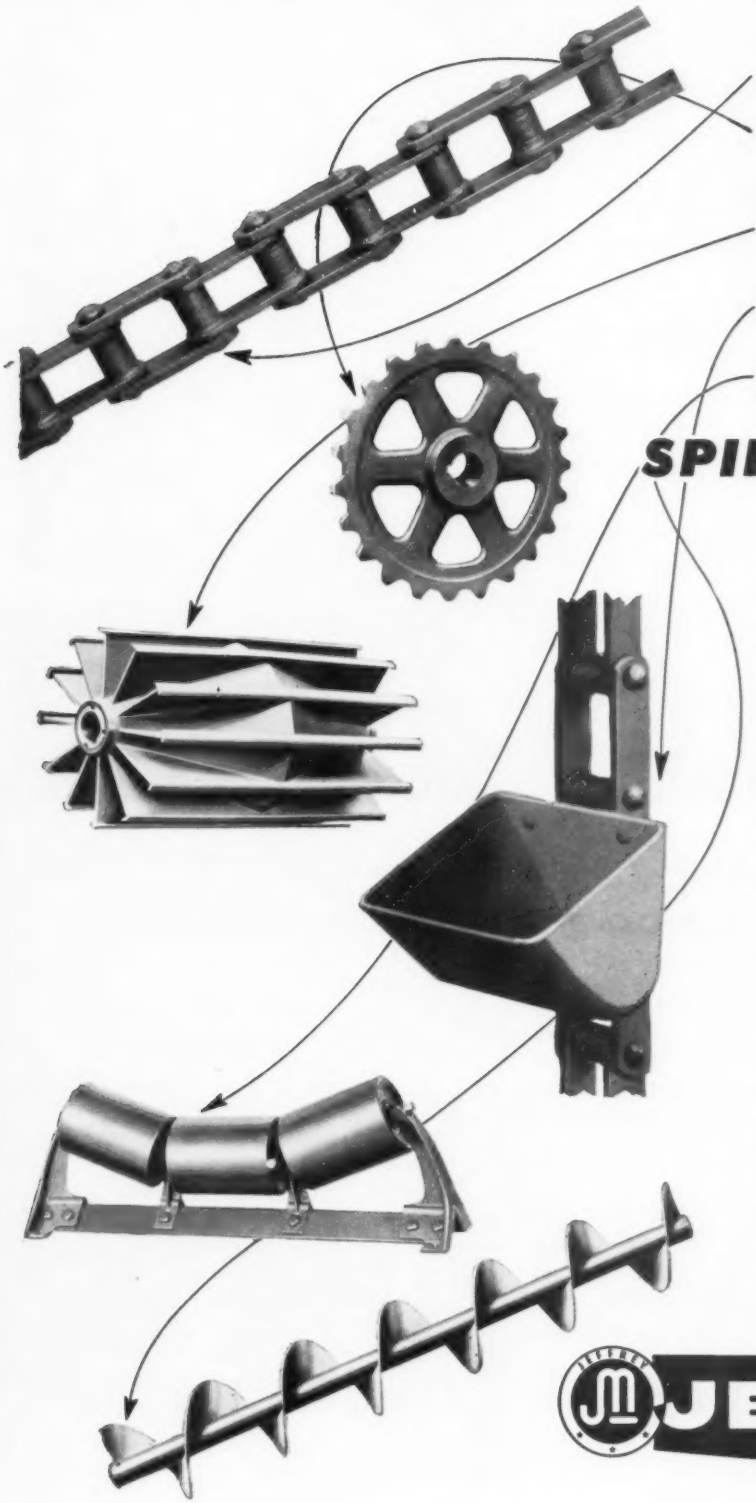
The Federal Machine and Welder Company

WARREN, OHIO

Warco PRESSES®

Specify **JEFFREY** when you replace



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PULLEYS
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YOUR Jeffrey distributor can supply the units you need for replacing worn parts and modernizing old equipment. Your materials-handling and power-transmission machinery will give more efficient, economical operation when you use these time-tested, dependable products.

Jeffrey replacement parts have the same sound design as those used on original equipment. All are designed for maximum service. Materials and workmanship are the finest. Jeffrey District Offices and Distributors are located in all principal cities. The Jeffrey Manufacturing Co., Columbus 16, Ohio.

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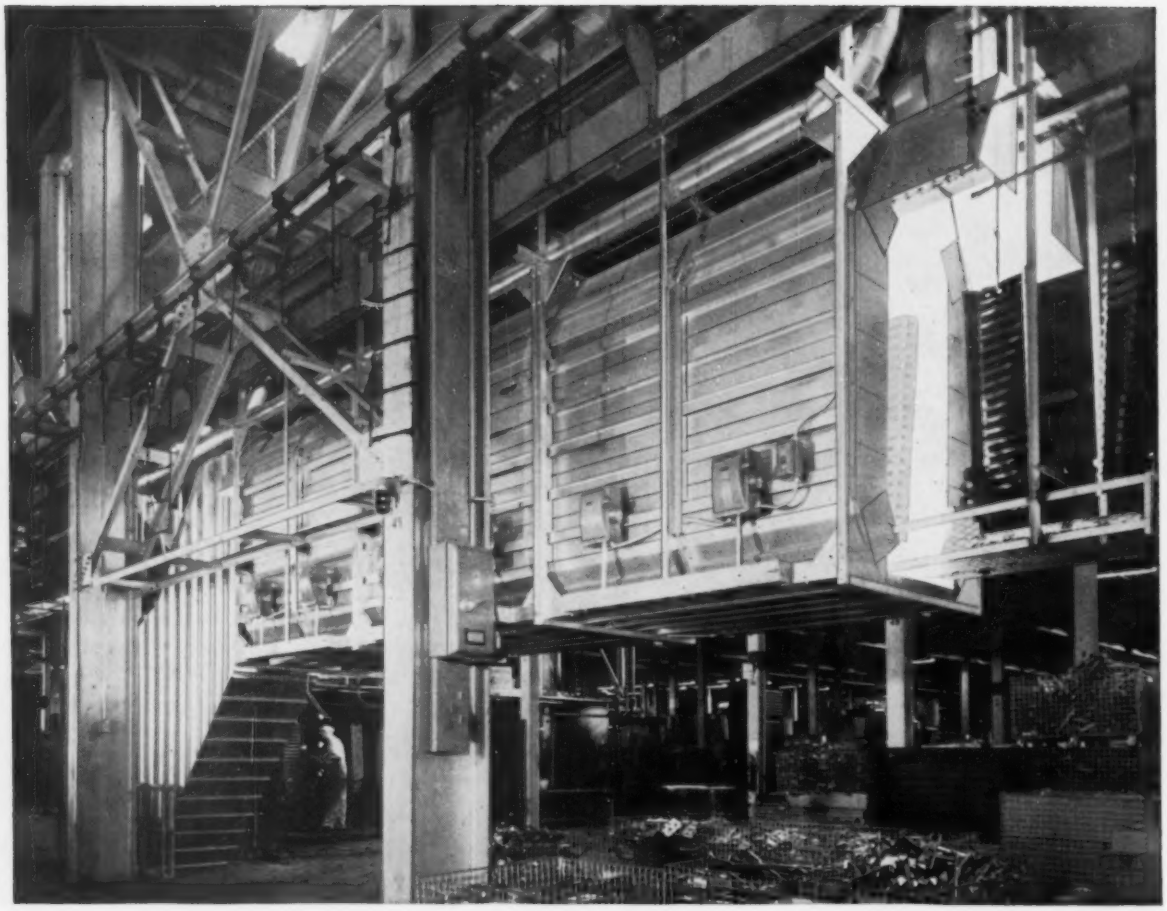
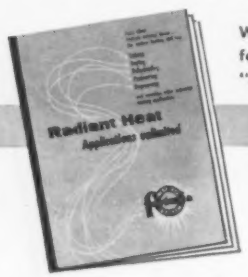


Fostoria Radiant Oven at Westinghouse, Columbus, Ohio

PROCESSES 24,000 PARTS EVERY WEEK

It takes only 15 minutes to dry refrigerator back-plate condensers for stacking—at the Columbus, Ohio Westinghouse plant, a recent addition to the company's Electric Appliance Division.

Using a fast-drying Fostoria Radiant Oven, this modern plant is able to process 10,000 to 12,000 condensers for major appliances, plus the same number of miscellaneous small parts, every 5-day week. In thousands of similar industrial applications, Fostoria Radiant Ovens speed up production, save valuable man-power . . . and cut operating costs as much as 50%. Fostoria design permits overhead installation to save work space (as shown above) and allows easy relocation, if necessary. Want to know how an efficient Fostoria Radiant Oven can save money and improve product quality *for you?* Send for complete details today!



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Pioneer manufacturer of radiant equipment—from components to complete ovens

Dow . . . industry's most complete line of chlorinated solvents

DOW

Safer. Lower toxicity and lower fire hazard make Chlorothene much safer for spray applications than other commonly known solvents. Chlorothene has an MAC rating of 500 ppm—20 times greater than carbon tet!

Better solvent action for cold degreasing with versatile, safer

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Chlorothene® (Dow 1, 1, 1—Trichloroethane, Inhibited) is sold exclusively by your Dow distributor. He's also the man who supplies DOW TRICHLOROETHYLENE, DOW PERCHLOROETHYLENE and DOW METHYLENE CHLORIDE for vapor degreasing and other specialized cleaning operations. Write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. S-941A-1, for more information.

Less Corrosion. Chlorothene quickly cuts greases, oils, tars, waxes and the most stubborn contaminants. Highly stabilized, it has extremely low corrosive effects on all common metals.

Versatile. A product of many uses, Chlorothene is described by enthusiastic users as "the best general-purpose cold degreaser . . . by far the safest and the easiest to use!"

Fast. Chlorothene cleans faster, more thoroughly—poses no skin absorption problem. Its topical effect is similar to that of other good organic solvents.

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DOW

AUTOMOTIVE . . . New Danly Underdrives form the car bodies of tomorrow—at lower cost for a highly competitive market.

Danly

presses produce more

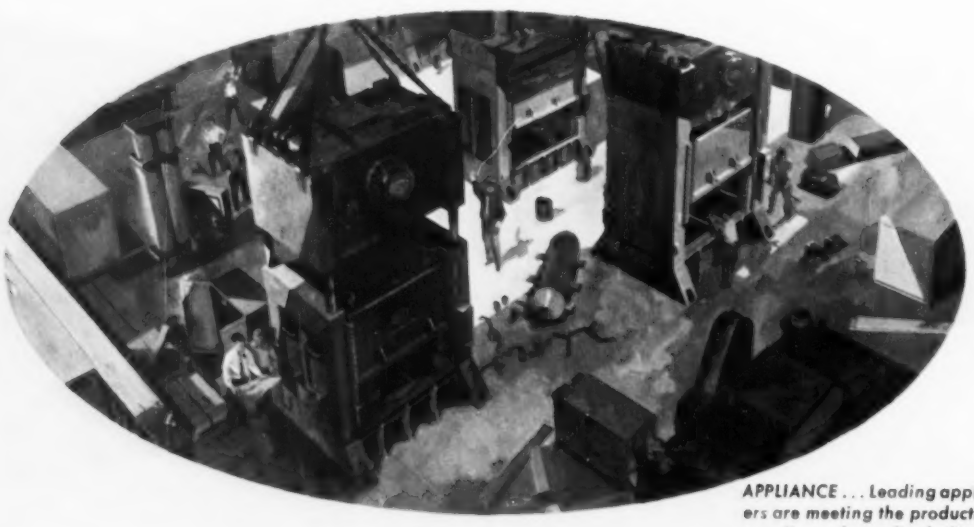
With Competition at an All-Time High, Successful Production Programs Are Being Built Around the Cost-Saving Advantages of Danly Presses

There are three basic reasons why leading industries invest millions of dollars each year in Danly Presses: 1) Engineering leadership, 2) Performance, 3) Dependability.

Engineering leadership—In new mechanical features, in safety, in operating efficiency . . . Danly has set the engineering pace. Every Danly Press is designed to meet specific, current production needs.

Performance—Each press type features all of the famous Danly advantages: extra rigid, balanced, precise construction; completely automatic oil lubrication system; cool-running clutch that lasts many times longer than conventional types; exclusive Danly control arrangements that promote operator safety and minimize accidental press damage.

Dependability—Danly engineering and construction pays off in more stampings over a longer period of time. Performance records in the largest shops prove that Danly Presses require less maintenance, greatly reduce need for spare parts.

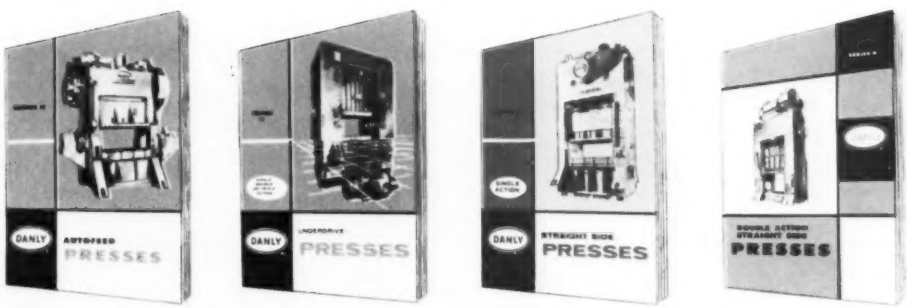


APPLIANCE . . . Leading appliance manufacturers are meeting the production challenge with new lines of new Danly Straight Side Presses.

in every industry

ELECTRICAL . . . New Danly Autofeeds are stamping electrical parts faster for less—with longer die life.

. . . at lower cost



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They Hold the Answer to Modern Mass-Production Stamping Problems

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Cleveland *Top Quality* Cap Screws

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Our job is to make, stock and sell the widest possible range of sizes in Cap Screws, Set Screws and Milled Studs—ferrous and non-ferrous: bright, high carbon and alloy steel heat treated, brass, silicon bronze, stainless steel. We also produce special hot and cold formed parts to your design and specifications. Standard Cap Screws are made in wide size ranges—3/16" to 2½" diameter and in lengths as you require.

For extra fast service we keep stocks-on-hand of every size and kind we catalog, made by the Kaufman *double extrusion* Process that assures you extra strength, extra fastenability. Write for latest Stock List!

Efficient stock "filing system" where millions of screws are ready for quick shipment from Cleveland's soon-to-be-occupied new plant.

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Warehouses: Chicago • Philadelphia • New York • Providence • Los Angeles

Photo courtesy Northrop Aircraft, Inc.

Rocket Sled Rides at Supersonic Speeds on Hard-Faced Slippers

Four hard-faced slippers bear the entire weight of this rocket-propelled sled as it hurtles down a special railway at more than 900 miles per hour. Hard-facing protects the slippers from abrasion and the tremendous frictional heat generated during each run, and enables them to make 12 trips. Before hard-facing was adopted, the slippers wore rapidly and often had to be replaced after every trip.

As the sketch (above) shows, each slipper is hard-faced at five locations with HAYNES STELLITE alloy No. 12 rod. The cobalt-base alloy is deposited by the metallic-arc method and then finished by machining.

The successful use of HAYNES STELLITE rod on the rocket sled slippers emphasizes several outstanding characteristics of this cobalt-base material. It has exceptional resistance to metal-to-metal wear and frictional heat. It retains its hardness even when exposed to temperatures in the red heat range. In addition, it will withstand the effects of corrosion, erosion, and oxidation, and it has a low coefficient of friction. This combination of properties makes it extremely valuable for protecting such industrial parts as valves, valve seats, bushings, pump shaft sleeves, mandrels, extrusion screws, punches, and dies.

For full information on the complete line of 19 HAYNES hard-facing alloys, designed for every condition of wear, write for the booklet, "HAYNES Alloys Hard-Facing Manual."

HAYNES TRADE-MARK ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation

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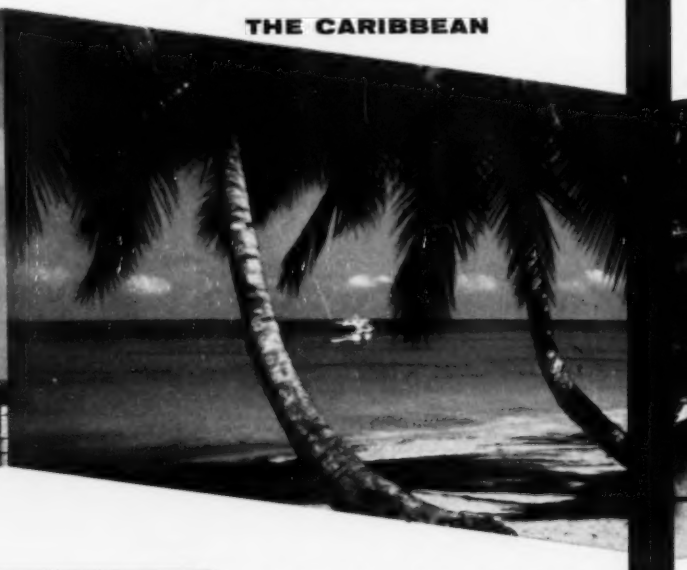

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JONES & NEW HORIZONS

Grand Prize:

Two-Weeks Luxury Vacation Trip for Two, All Expenses Paid, to a choice of one of the following: Paris, Hawaii, The Caribbean, The Canadian Rockies, Plus $400 for spending money, baby sitter fee, etc.

Two 2nd Prizes: Each a Seven-Day All-Expenses-Paid Luxury Vacation for Two to Bermuda. Plus $200 spending money.

Three 3rd Prizes: Each a Shopmaster Combination Saw-Jointer Power Tool, complete with motor.

Ten 4th Prizes: Each a Shopmaster Individual Single-Purpose Power Tool (A Choice of Saw, Drill Press, Jointer, etc.)

Jones & Lamson, famed for opening up NEW HORIZONS in metalworking efficiency, now offers you, personally, NEW HORIZONS — a luxury vacation for two people for two weeks with all expenses paid, to your choice of Paris, Hawaii, The Caribbean or The Canadian Rockies.

Think of it — you can enjoy deluxe travel, finest hotels and accommodations, the very best of everything, plus $400 spending money. Live like a millionaire for two weeks, for just answering this question, "Which Jones & Lamson machine, or machine feature, could, or does, help you most, and Why?"

When you write in (use coupon or not, as you wish), we will send you an official entry form, together with information upon which to base your answer. So don't delay! Even if you've never entered any contest before . . . if you have a good idea and can express it clearly — *YOU* may win this glorious luxury vacation for two! And don't forget — there are other prizes! — two deluxe 7-day all-expenses-paid vacations for two to Bermuda, and 13 prizes of famous Shopmaster home workshop Power Tools! Enter *today!* Read the simple rules, and send in this coupon *NOW!*

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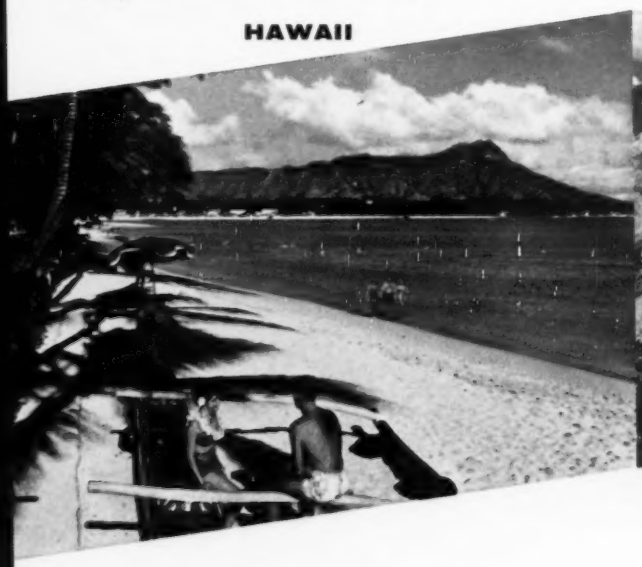
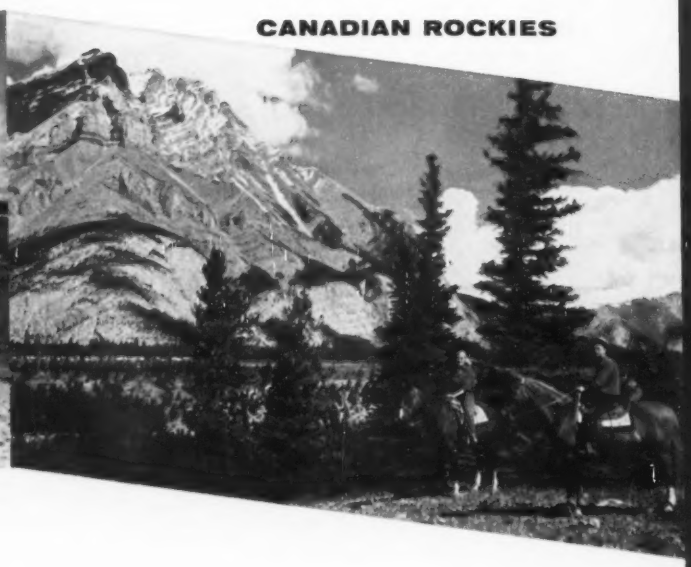


CANADIAN ROCKIES



LAMSON'S CONTEST

CONTEST RULES

Contest is open to all persons, residing in the continental U. S. A., engaged in metalworking or allied industries, except employees of Jones & Lamson Machine Company, its selling agents and its advertising agency, and members of their families.

Contestants merely answer, in 150 words or less, the question "Which Jones & Lamson Machine, or Machine Feature, could, or does, help you most, and Why?"

Entries are to be mailed to Jones & Lamson NEW HORIZONS CONTEST, Box 364, Back Bay Annex, Boston 17, Massachusetts.

Entry must be contestant's own, and must be handprinted or typed on an official Jones & Lamson NEW HORIZONS CONTEST entry form. Entry forms that are not completely filled out will be disqualified. Entry forms filled out in handwriting will also be disqualified. No entries will be returned, and all entries become the property of Jones & Lamson Machine Company.

The submitting of a contest entry implies the contestant's agreement with and submission to all contest rules. Contest entries must be postmarked by midnight July 10, 1956 and received by July 20, 1956.

Board of Judges will include machine tool engineers, production foremen, business executives, trade publication editors, and an engineering college faculty member.

Judges' decisions are final. Entries will be judged for aptness of thought, originality and sincerity. "Literary style", as such, will *not* be a deciding factor. Elaborate or "fancy" entries will receive no extra consideration.

Winners will be announced in Jones & Lamson Machine Company advertisements in trade publications as soon as possible after the judging of the contest.

Easy to Enter! You Could Win!

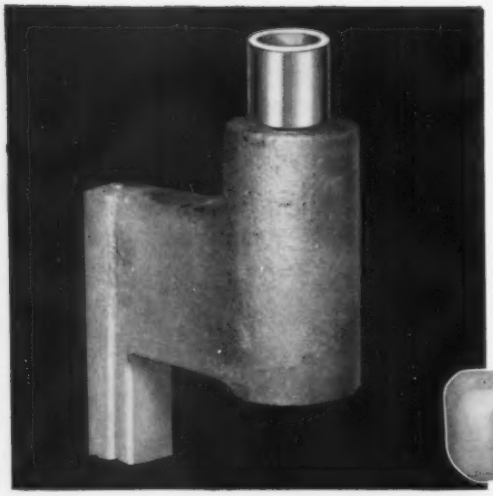
JONES & LAMSON MACHINE COMPANY
511 Clinton Street, Springfield, Vermont

Please send official NEW HORIZONS CONTEST entry form and information to:

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____



A Johnson Bronze bushing is inserted in the cut-off lever for a No. 3 Baird four-slide wire forming machine

Baird four-slide wire forming machine.

Johnson Bearings Help Maintain Baird's Reputation for Building Durable Machinery

The 110-year old Baird Machine Co., of Stratford, Conn., has an enviable reputation for the production of durable wire forming machinery. All of their machines are built to last—*without losing their tolerances.*

"We have to make sure that every part, down to the smallest bolt, is going to stand up just as long as the heavy cast bed of the machine itself," says Mr. Carl F. Johnson, Purchasing Agent for Baird. "Johnson bearings, we've found, fill those requirements. We've never once had a complaint about Johnson's, and we've been using them for a good many years. At the same time, they don't cost a fortune."

Like the one near you, Baird's Johnson Distributor stocks a good supply of a selection from 900 standard cast bronze bearings. As the Baird Purchasing Agent says, "We never worry about our Johnson inventory. It's a simple matter of making a phone call to replenish our supply. This removes a big problem of stock space and inventory control." At the same time, Baird is aware that skilled Johnson field engineering service is available at any time, should a problem arise.

Why not let your Johnson distributor help you to improve the quality of your products while reducing costs—with Standard Johnson Bearings? Johnson Bronze Company, 505 S. Mill Street, New Castle, Pa.

Johnson Bearings

GRAPHITED
over 175 sizes

GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 400 sizes

ELECTRIC MOTOR
over 350 sizes

for dependable deliveries of cold rolled specialty steels —call CRUCIBLE

Crucible is geared to give you *reliable, on-time deliveries* of a wide variety of cold rolled specialty steels—carbon spring, alloy strip . . . coils or cut lengths . . . in the size, finish and temper you specify.

And you're sure of *quality* from Crucible—*fine finish . . . better edges . . . improved flatness.*

So, for prompt deliveries, timed to meet your production schedules—call Crucible. And, for handy reference—mail the coupon for your free copy of Crucible's 32-page fact-filled book on cold rolled specialty steels. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

Crucible Steel Company of America
The Oliver Building, Mellon Square,
Pittsburgh 22, Pa.

I'd like a copy of your 32-page booklet on cold rolled specialty steels.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

"...and then they put that hot bar of metal between the upper die and the lower die and.....WHAM!"

Look who's showing off! Well, he doesn't know everything—yet! But he sure has learned something about his old man's forging business from that color booklet in his back pocket.

It's called "Forgeland, U.S.A."—an interesting, instructive book about *your* business and *ours*, written in *his* language and with pictures, too! We've prepared it here at Erie, because we think it's nice for Pop to be a hero in his own home—and we're all for encouraging it.

To quote your beloved smart-aleck, "Aw c'mon Dad, get me the book will yuh, huh, please, huh, please—it's for FREE, anyhow . . . not even any box tops or hammerscale to send in!"

let your Youngsters learn about FORGING

If you have a raft of kids—send for a raft of books:

ERIE FOUNDRY CO., ERIE, PA.

Send_____"FORGELAND U.S.A." Books to:

NAME_____

FIRM_____TITLE_____

ADDRESS_____

CITY_____STATE_____

ERIE

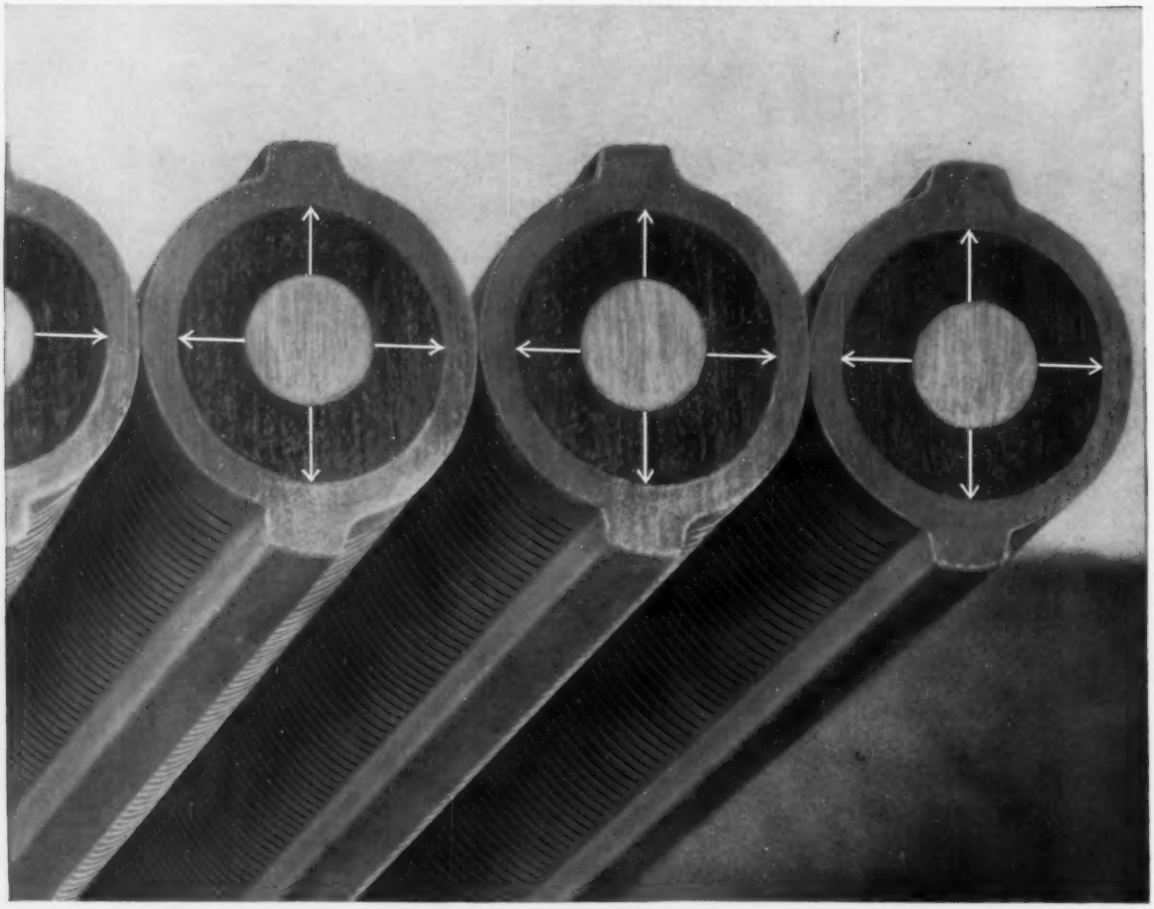
ERIE FOUNDRY CO. ERIE, PA.

"OUR 61st YEAR"

FORGING HAMMERS • TRIMMING PRESSES • HYDRAULIC PRESSES AND ALLIED EQUIPMENT

EXIDE-IRONCLAD BATTERIES

For electric industrial truck operation



Power tubes expand without shedding — preserve battery life

BATTERY FOR ELECTRIC INDUSTRIAL TRUCK. Exide-Ironclad Model TH. Write for Bulletin No. 5161.

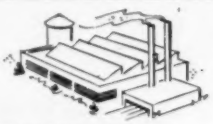
Every time you discharge a storage battery, the active material on the positive plates expands. But the plate grids don't expand. This is basic.

On most batteries, the expanding active material tends to shear off from the nonexpanding grid every time the action takes place. But this can't happen in the Exide-Ironclad Battery. The reason is simple.

Active material is formed concentrically around the spinelike grid and held inside the plastic tubes. Expansion is predominantly in an outward direction—hence no shearing. Active material remains firmly locked to the underlying grid structure. And the flexible plastic tubes yield and take up as needed.

This extra protection against shedding of active material is only one of the many reasons for the long life of Exide-Ironclad Batteries. When you order heavy duty batteries, or the equipment requiring them, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

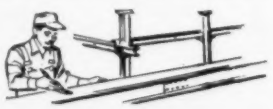


PROVED THROUGHOUT INDUSTRY FOR OVER THIRTY YEARS

Industrial leaders all over the world have used Rust-Oleum to stop and prevent rust for over thirty years. Rust-Oleum can do the same for your tanks, stacks, pipes, machinery, metal sash, wire fences, girders, etc.

RUST-OLEUM IS EXCLUSIVE

Rust-Oleum uses a specially-processed fish oil vehicle that penetrates rust to bare metal, dries right, and is free from objectionable odor. Accept no substitutes. Buy—and specify Rust-Oleum. You'll be happy that you did. There is only one Rust-Oleum—it is distinctive as your own fingerprint.



APPLY DIRECTLY OVER RUSTED SURFACES

Just scrape and wirebrush to remove rust scale and loose rust—then brush Rust-Oleum 769 Damp-Proof Red Primer right over the remaining rust, usually eliminating costly surface preparations. Then—follow-up with your desired Rust-Oleum finish color.

MANY COLORS, INCLUDING ALUMINUM AND WHITE

You beautify as you protect, because Rust-Oleum finish coatings are available in practically all colors, including aluminum and white. They use the same basic rust-inhibiting vehicle as Rust-Oleum 769 Damp-Proof Red Primer and so provide double protection.

GREATER COVERAGE—EASY TO USE

Rust-Oleum is so easy to apply by brush or spray that one man can often do the work of two. Because of Rust-Oleum's easy-flowing qualities, an average of 30% more coverage is usually received—depending upon the type and porosity of the surface.

PRACTICAL ANSWER TO YOUR RUST-PRODUCING CONDITIONS

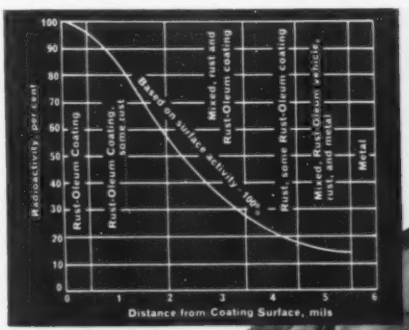
Rust-Oleum dries to a firm, decorative finish that resists salt water, heat, fumes, sun, steam, humidity, and weathering. Whatever your rust problem—you'll find Rust-Oleum the modern, practical way to stop rust.

Facts

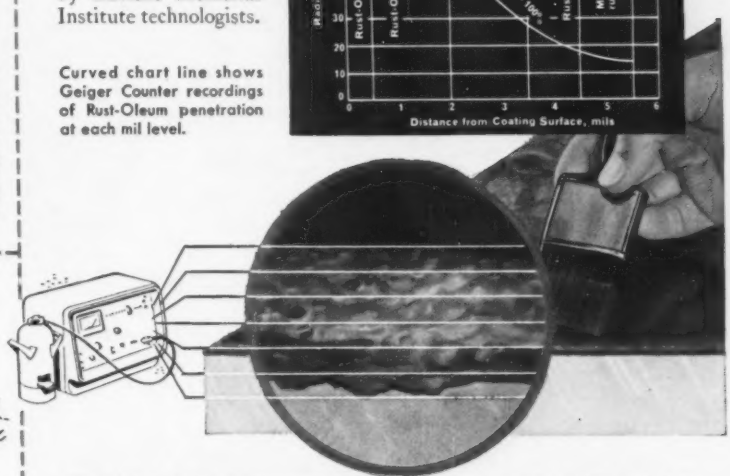
prove the economy of

RUST-OLEUM®

Geiger Counter traces Rust-Oleum penetration through rust to bare metal. The results of radioactive research prove that Rust-Oleum penetrates rust to bare metal. Rust-Oleum's *specially-processed* fish oil vehicle was radioactivated and formulated into Rust-Oleum 769 Damp-Proof Red Primer—then applied to rusted test panels. Geiger Counters then traced Rust-Oleum's *specially-processed* fish oil vehicle through the rust to bare metal. This penetration enables Rust-Oleum to be applied directly over sound rusted surfaces—usually eliminating costly surface preparations. Attach coupon to your business letterhead for your thirty-page report, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust On Steel Specimens," prepared by Battelle Memorial Institute technologists.



Curved chart line shows Geiger Counter recordings of Rust-Oleum penetration at each mil level.



RUST-OLEUM®

STOPS RUST!

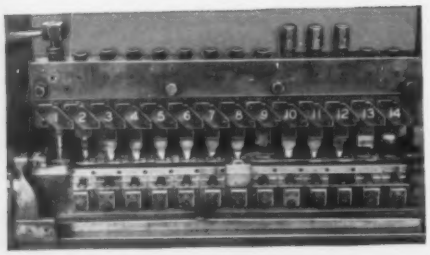
See our Catalog in SWEETS, or write for complete information. Prompt delivery from Industrial Distributor stocks.

ATTACH TO YOUR LETTERHEAD—MAIL TODAY!

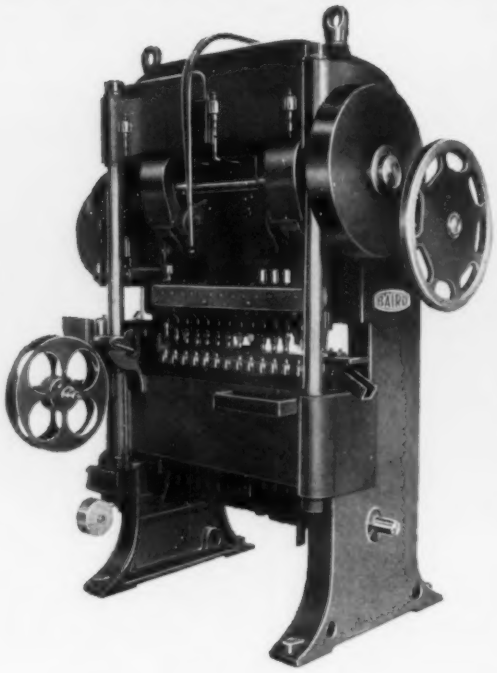
Rust-Oleum Corporation
2565 Oakton St.,
Evanston, Illinois

- ☐ Complete literature with color charts.
- ☐ Thirty-page report on Rust-Oleum penetration.
- ☐ Nearest source of supply.

...ask BAIRD about it



A complete die set with full compliment of punches and dies in working position and with transfer in loading position. Note accessibility of all mechanisms and adjustments.



What is so different about BAIRD Multiple Transfer Presses

Many still confuse these advanced high production machines with multiple-slide presses (commonly called eyelet machines) or with equipment using progressive dies.

They are, in fact, entirely different . . . and the advantages of Baird design result in much more flexible and versatile tooling . . . much less down-time for initial tooling, maintenance and change-over . . . use of minimum width stock . . . maximum production speeds smoothly maintained.

In addition, Baird Multiple Transfer Presses can maintain closer tolerances than previous methods on high production of parts requiring from 8 to 15 consecutive operations.

So smoothly do these machines operate that old-time press-room clatter is a thing of the past. Normally, long production runs at high speed may be maintained without adjustment down-time.

If you are looking for the most modern equipment available for volume production of press-produced parts . . . by all means "ask Baird about it." Our development of the Baird Automatic Multiple Transfer Press has set many new standards in this field. Write Dept. IA.

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING MACHINES • AUTOMATIC PRESSES • TUMBLING BARRELS

THE BAIRD MACHINE COMPANY

STRATFORD CONNECTICUT

2BA56

"You say I can see vibration, measure it, and eliminate it?"

1 "How much vibration do you think my machine has?"

No need to guess—the Veelos Vibration Analyzer shows exactly! This amazing electronic tester measures vibration amplitude down to *2-millionths of an inch*—tests one belt against another, actually shows which belt has "invisible shakes" . . . and how much! Don't guess about vibration; it's costing you hard cash every minute you ignore it. Ask your Veelos salesman to test your belts with the Vibration Analyzer.

2 "Isn't vibration caused by a number of things?"

Vibration can be caused by bearings, motor, clutch, sheaves or V-belts. Quite often it is caused by V-belts alone. The Veelos Vibration Analyzer uses a "strobe" light which "stops" the motion—shows exactly *what* is vibrating! It shows you precisely how much vibration you're paying for, and lets you correct it. The Vibration Analyzer gives positive proof, and the test takes only 15 minutes. It's free, of course.

3 "How do I eliminate costly belt vibration?"

Install Veelos, in place of ordinary V-belts! V-belts have spots of varying density, due to their construction, which throw them out of balance. Veelos belts are absolutely uniform; every stud and link is identical; *every foot of the reel* is identical and uniform; and they're perfectly balanced! Test any belt for vibration against Veelos—you're in for a shock. Your Veelos salesman will show you how to cut costs and improve your operation.

VEELOS
THE BALANCED
LINK V-BELT

Veelos is known as Veelink outside U.S.A.

For free vibration analysis or Veelos Data Book write to:

MANHEIM

Manufacturing & Belting Company
208 Stiegel St., Manheim, Pa.

"Industrial Belt Specialists Since 1911"

Adjustable to any length • Adaptable to any drive • Balanced power • Constant power • Vibrationless power

TITANIUM STRIP is descaled continuously on time cycles as low as 30 seconds, with excellent results.

10-MINUTE IMMERSION loosens scale on 5 tons of stainless wire. A water quench, 3-minute acid dip, and final water rinse produce a clean, bright surface with no pitting or etching.

Use this fast, safe Hooker Process for descaling steel and titanium

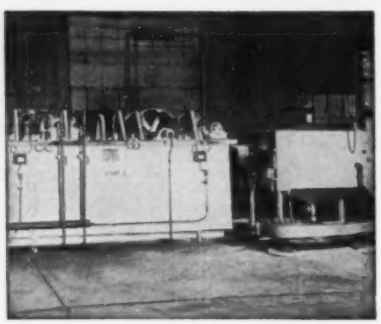
Descale alloy steels and titanium in any form—rapidly, safely—using the Hooker Process with Virgo® Descaling Salt.

A bath of molten Virgo Descaling Salt quickly converts scale, rust, and other surface impurities to an acid-soluble coating. A quench, acid dip, and final spraying then remove this coating in from one-tenth to one-hundredth the usual pickling time, with no measurable effect on the base metal.

You can easily set up the Hooker Process for batch or continuous operation on any form of work including strip, sheets, bars, wire, tubes, plate, castings, forgings, and fabricated parts. You can usually process work as fast as your handling methods allow, with a minimum of supervision. Operation is safe for personnel, and there is little or no spent-acid disposal problem.

You can profit by the experience of more than 50 companies now using the Hooker Process successfully to speed up descaling of alloy steels and titanium in practically every form.

You'll get quick service on any descaling problem, by writing or phoning us. Complete test and engineering facilities are at your disposal, without obligation.



LIGHT-GAUGE ALLOY STRIP is descaled at 20-35 ft. per min. in this Virgo bath, after annealing.

Send for these bulletins—Get the whole story on Virgo Descaling Salt for alloy steels and titanium . . . how the Hooker Process works, its advantages, how to set up a Virgo descaling line, and the services you enjoy as a user. No obligation. Write us today.

From the Salt of the Earth

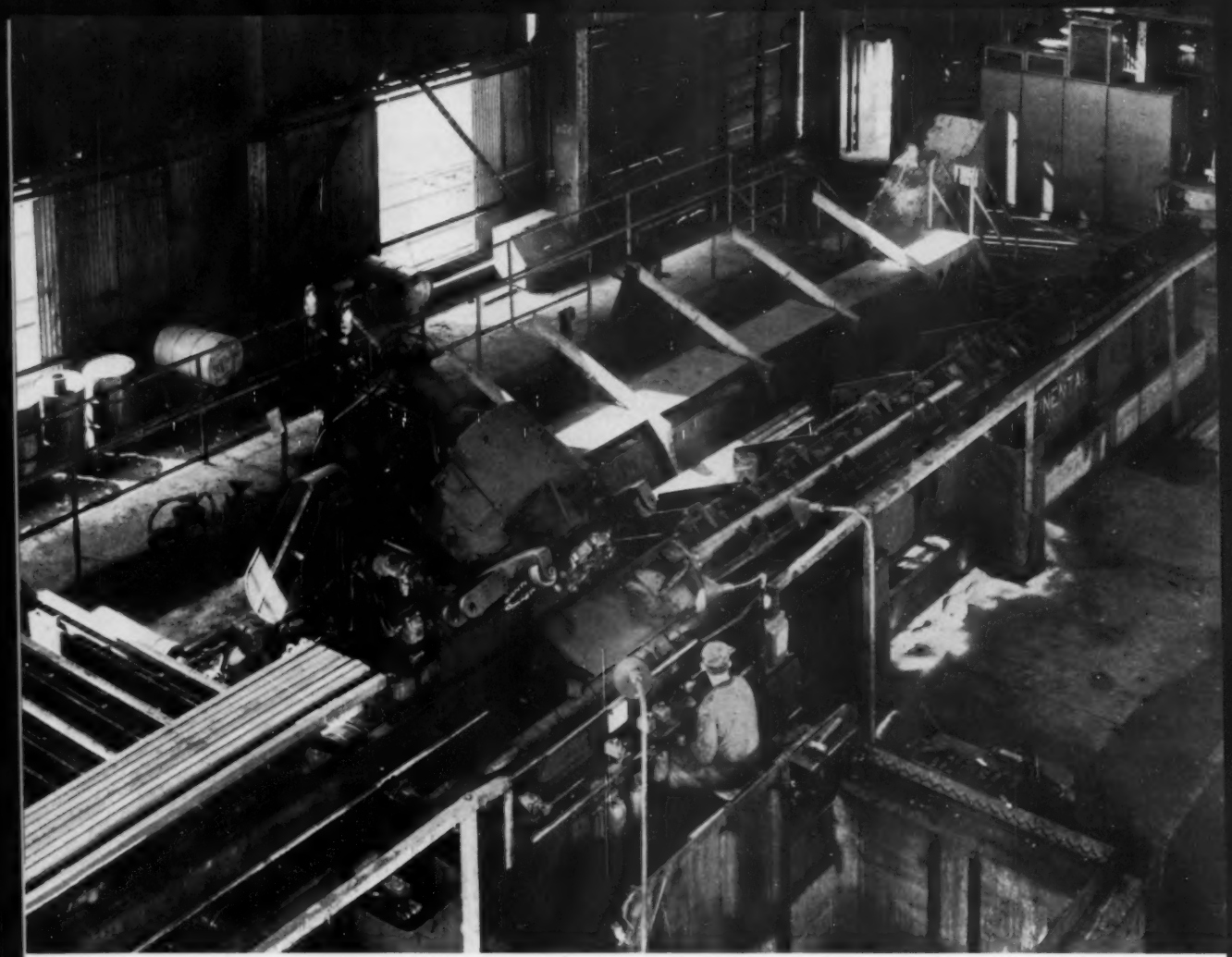
HOOKER CHEMICALS

4-1098

HOOKER ELECTROCHEMICAL COMPANY

33 THIRTY-SEVENTH ST., NIAGARA FALLS, N. Y.

NIAGARA FALLS • TACOMA • MONTAGUE, MICH. • NEW YORK • CHICAGO • LOS ANGELES



BLAW-KNOX makes what it takes

for continuous, mechanical chipping

The Continental Chipper with auxiliary equipment is a complete mechanical system for sorting, handling, inspecting and chipping billets. This integrated system has demonstrated in-service cost savings over manual conditioning. It represents a wise investment in long range modernization programs for conditioning for subsequent rolling in merchant and bar mill operations.

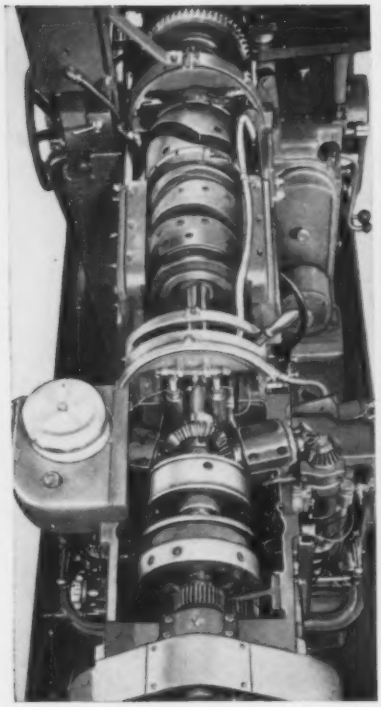
Product quality improvement is immediate, positive. Precise chipping is accomplished by a non-traveling cutter head under which the billet moves in a fashion similar to a milling machine. All chipping is done at close range, immediately in front of the operator. This single operator, located in front of the cutter head controls the entire operation including all material handling.

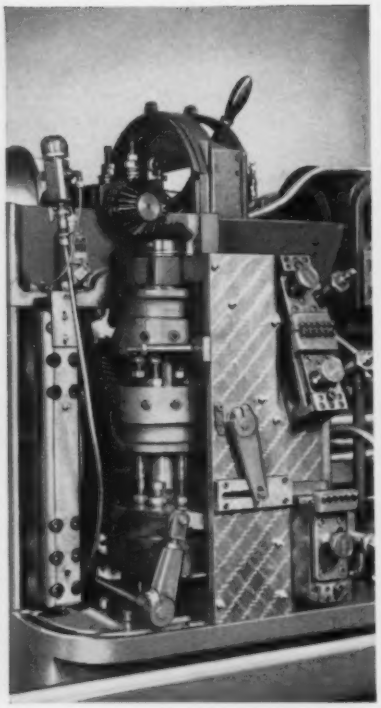
The chipper is equipped with special interlocking devices which eliminate unsafe operation. Usual chipping bay hazards such as high pressure air lines, improperly handled chisels, and flying chips are removed. The Continental Chipper accommodates billets up to 30 feet in all merchant and bar mill sizes.

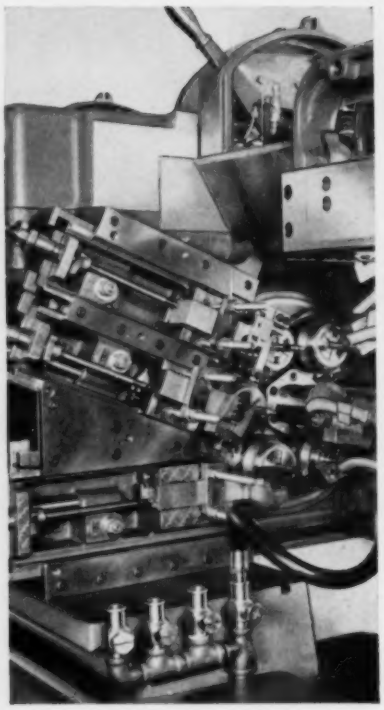
For complete details, write for illustrated booklet.

50th Anniversary
BLAW-KNOX
1906-1956

BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania





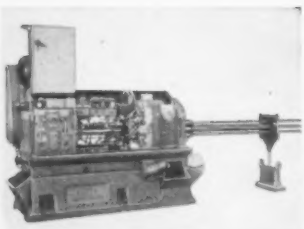


Seven Fast Changeover Models

With the prospects of improved tool materials ever decreasing the actual machining time of work on Multiple Spindle Automatics, long runs tend to become short runs. Facility that decreases the time for job changes becomes more important to low-cost production.

Conomatics are available in as many as seven fast changeover models. These are the 9/16", 1", 1⅝" Sixes and the 2½", 3½", 5", and 5¼" Fours.

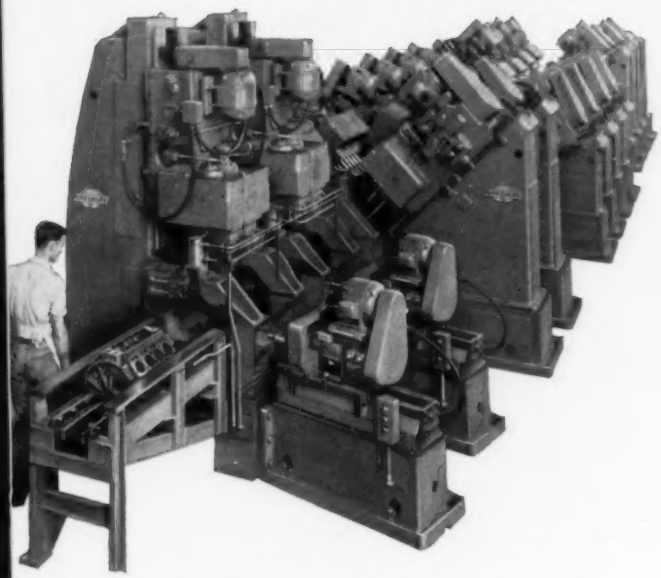
These models are equipped with dial adjustment of working stroke of all slides, without making necessary change of total stroke or positive stop settings. Write, wire or phone for literature descriptive of these features and other facilities available to users, or prospective users.



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.

NOW . . . BIGGER TO SERVE YOU BETTER



New, Enlarged Production Facilities Speed Delivery of Greenlee

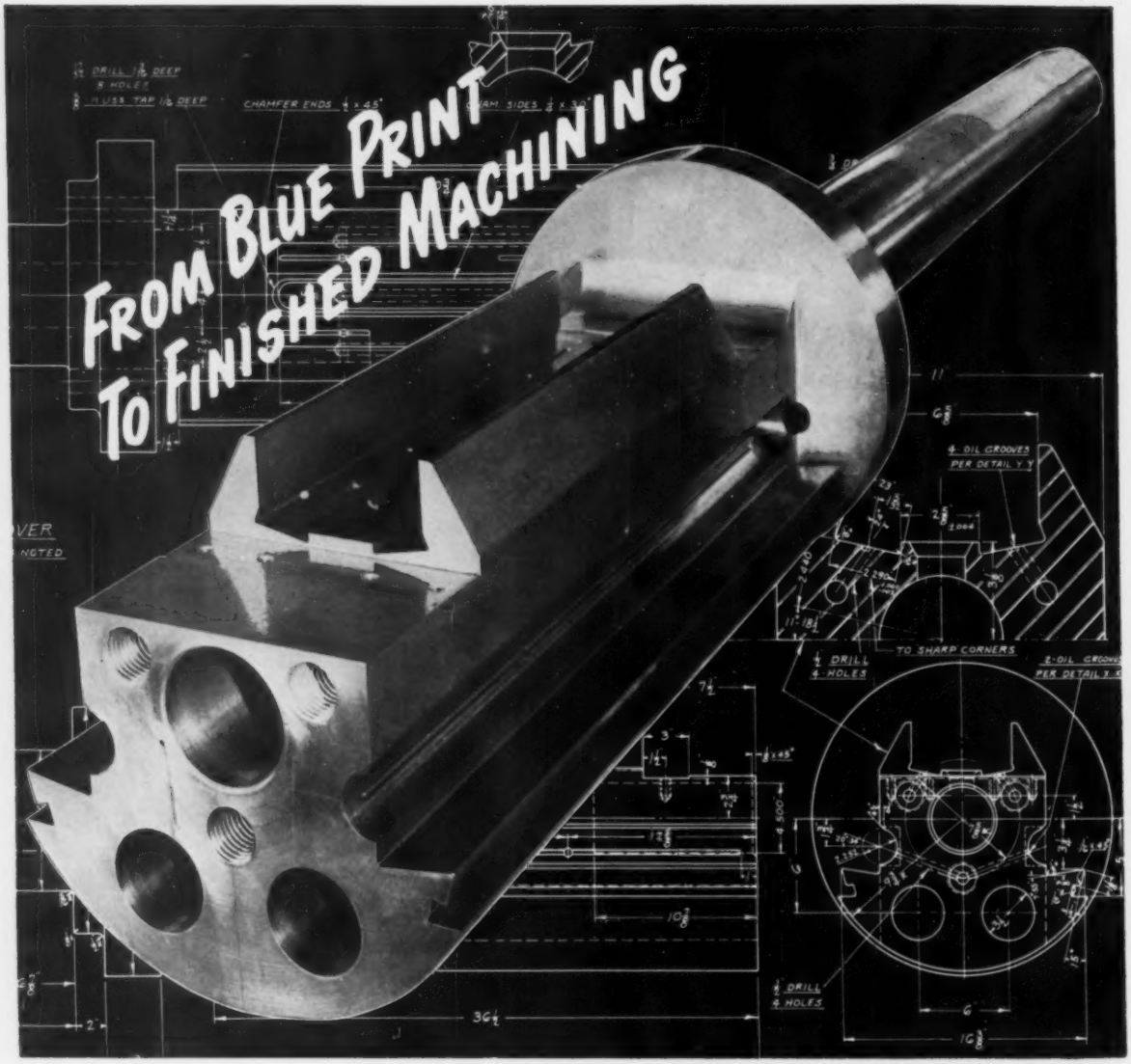
TRANSFER MACHINES

Pictured is one of four Greenlee assembly floors. This newly constructed, block-long building covers almost two acres of ground . . . provides a well-lighted, roomy area for erecting and testing Greenlee Transfer Machines similar to the ones illustrated.

This 17-Station Greenlee Transfer Machine, the first in a line of three . . . carries 152 tools. It automatically drills, countersinks, cleans and gauges holes in V-8 cylinder blocks. Take advantage of Greenlee's specialized assistance in planning for automatic production. Write or wire today for a consultation.

PRODUCTION MACHINERY
GREENLEE

GREENLEE BROS. & CO.
1806 Mason Avenue
Rockford, Illinois



This Block Body for a Tension Reel represents the coordinated effort of many National Forge skills in turning out the required electric alloy steel, the proper heat treating and the intricate machining to exacting tolerances.

National Forge offers you complete forging service in one plant—under one responsibility.

Why not take advantage of this "all-in-one" service the next time you need forgings?

For full information, write NATIONAL FORGE AND ORDNANCE COMPANY, Irvine, Warren County, Pennsylvania.

Production

is behind SANDVIK SPRING successful performance

Sandvik specialty steels are carefully produced in relatively small quantities which facilitate closer control and uniform results.

Pure Swedish ore and coniferous, sulphur-free fuel are used to produce pig iron of unusually high quality. Sandvik's small blast furnaces and steel furnaces afford closer control of the quality of each heat.

In the subsequent rolling and annealing operations, Sandvik applies its specialized experience, skill and equipment,— "tailoring" the steel to the precise gauge, hardness and surface finish required.

The final result is the inherent quality which has made Sandvik spring steel successful in so many exacting applications.

You can get Sandvik strip steels:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock — also slitting facilities available.**

Ask your nearest Sandvik office for further information or technical assistance.

Sandvik Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical, etc. • Razor Blades • Shock Absorbers • A Wide Variety of Springs • Trowels • Reeds: Vibrator, Textile, etc. • Piston Ring Segment and Expanders • and many other applications.

Write for this Free, complete Sandvik catalog.

SANDVIK STEEL, INC.

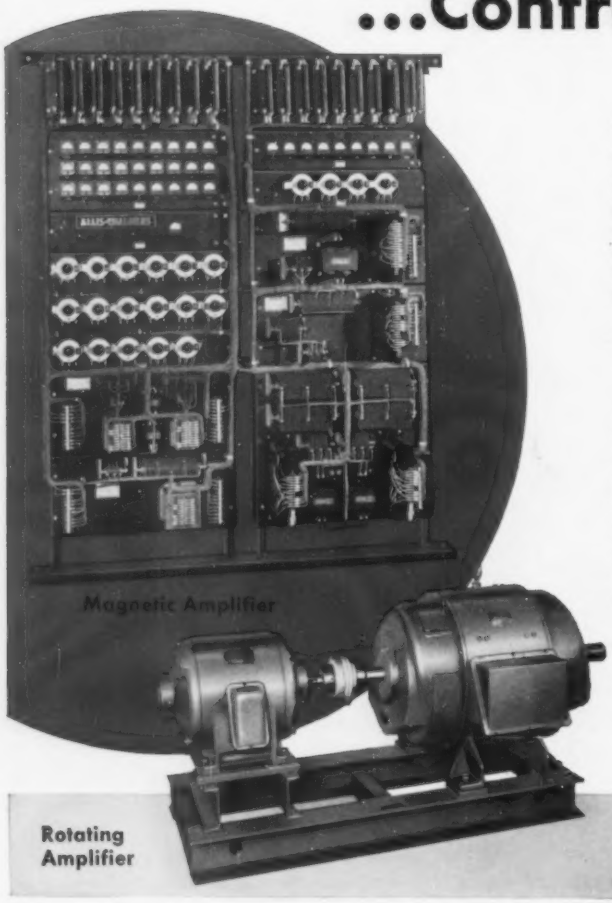
1702 Nevins Road, Fair Lawn, New Jersey

Tel. Fair Lawn 4-6200-In New York City: ALgonquin 5-2200

WAREHOUSES: Fair Lawn, N. J. • Cleveland • Los Angeles
BRANCH OFFICES: 230 N. Michigan Ave., Chicago 1, Ill., FRanklin 2-5638; 8650 Brookpark Rd., Cleveland 29, O., ONtario 1-3205; 6309 E. Olympic Blvd., Los Angeles 23, Cal., ANgelus 3-6761
SANDVIK CANADIAN LTD., P. O. Drawer 430, Station O, Montreal 9, P.Q. SANDSTEEL SPRING DIVISION • Fair Lawn, N. J. • Industrial Springs. SANDVIK SAW & TOOL DIVISION • Fair Lawn, N. J. • Saws and Tools
WORKS: Sandviken, Sweden • Hellefors, Sweden

You get **MORE** when you Specify Allis-Chalmers

...More Mill Production ...Control Over Quality



Rotating Amplifier

The most important factor in meeting the challenge of more tonnage and improved quality is effective regulation. And effective regulation is more than a matter of good regulator design. It embraces overall *system* design . . . the integration of generators, exciters, motors, regulators and other control equipment. As manufacturer of all these interdependent components, Allis-Chalmers is in a unique position to provide this practical approach to mill regulation.

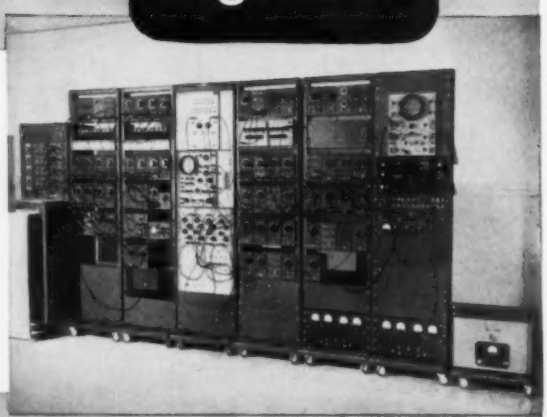
"Coordineered" System

Allis-Chalmers maintains separate departments, staffed by specialists, for each product. "Coordineering" results from an interdepartment exchange of ideas and technical information correlated in *one* department specializing in metals-producing industry application. All components are matched to meet the requirements of your job. Responsibility for system performance rests with one company.

For complete information, see your Allis-Chalmers representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.

A-5029

ALLIS-CHALMERS
Regulators



Three Types of Regulators Available

The following types of regulation are "coordineered" into an Allis-Chalmers system:

1. ***Regulex* Rotating Amplifier** — Applicable where high power levels for reversible output are desired.
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Analytical Facilities Utilized . . .

System performance is simulated in the computers to get optimum configuration of components. The constants and exciter ceilings necessary for desired response are established.

Regulex is an Allis-Chalmers trademark.

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NEWSFRONT

Nickel Pressure's Growing

Pressure continues to mount in Washington for the government to do something about the supply of nickel. Even alloy steel users are trekking to Washington in an effort to qualify for more nickel under the government's small business expediting service. Some automotive parts makers have bluntly told Chamber of Commerce that there's only one solution open—return to government rationing.

Vapor Degreasing Interest Heightens

Chlorinated solvent vapor degreasing is attracting a fresh wave of attention with the boost in industry demand for nonferrous-metals degreasing installations. Process is particularly attractive for rapid degreasing of large, complex parts. One aircraft firm degreases a 50 ft aircraft wing section in 1.5 minutes, preliminary to etching the section on same line.

Hang on—Or Hope?

Biggest problem dogging smaller firm P. A.'s is whether to hang on to cold-rolled sheet quotas for third quarter. When smoke clears, it's a safe bet that a surprisingly large number will be taking full quotas. Reason: they're still worried that automotive buying in September will again be strong enough to pinch their allotments, despite currently heavy auto inventories on cold-rolled sheet.

Silicon Rectifiers: A Rosy Future

Silicon rectifiers seem a good bet to take over more and more ac/dc conversion chores. They're smaller than equivalent selenium, copper oxide rectifiers, can be hermetically sealed against just about any type contaminant. Other advantages offered: good overload capacity, long-term stability, minimum variation in voltage delivered to dc motors. Clincher item: cost is in some cases less than that of selenium rectifiers.

John Q Really Uses Water

John Q (U. S.) citizen's raw material requirements—particularly water—stagger the imagination. It takes 1260 lb of iron; 18,000 lb of fuel of all kinds, 400,000 gal of fresh water to support one individual American for one year. Many scientists believe water may well be the most critical material of the future.

Nuclear Navy Coming?

Navy is reportedly readying plans for large scale conversion of existing ships to atomic power. Program will probably be kicked off in Navy shipyards if approved, but it is hoped it will be spread out to private yards as well to give them experience. Also in talking stage is thought of spreading out subcontracts to give more firms knowhow in atomic matters.

It's Hot up Yonder

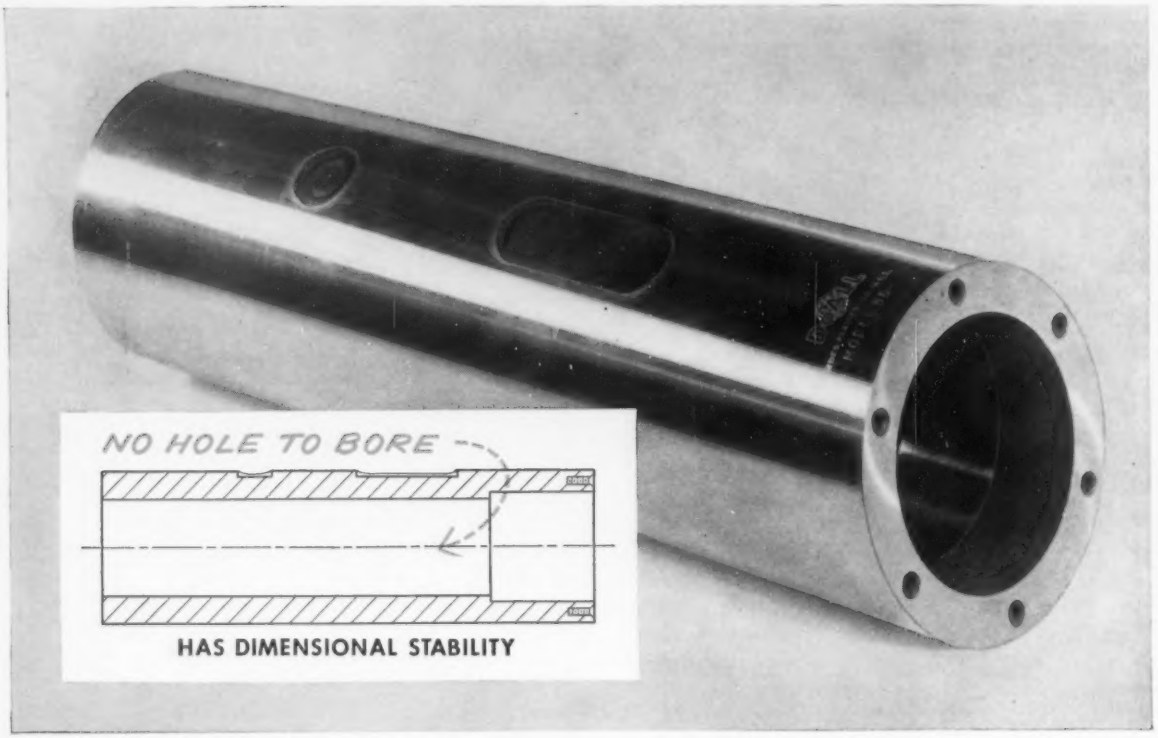
Aircraft industry of the future has some rugged problems to overcome. Idea of the complex requirements involved is illustrated by fact that, in future planes, engineers now predict that power required for refrigeration may well exceed power required for propulsion.

Which Way Will Packard Jump?

Studebaker-Packard's position in the auto industry isn't getting any better. Packard has postponed tooling orders it placed for 1957 models, pending the outcome of negotiations for a new merger. Result has been speculation that Packard line may be dropped entirely next year while company concentrates on face-lifting the Studebaker.

Let Labor Get Its Hand In

You can reduce costs 10 to 40 pct, advises one material handling expert, by getting labor into the work simplification act. Plan is to help workers to better understand local plant problems; train them in use of simpler problem-solving techniques, evaluation methods. Thus employe will junk his own wilder ideas, won't resent their getting "lost" in suggestion box system.



DoALL switches to TIMKEN® seamless steel tubing —cuts spindle housing cost 26%

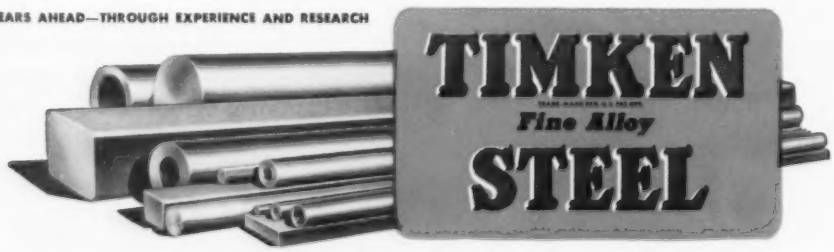
THE DoALL Company faced a tough problem in reducing production costs of its precision spindle housing, while retaining the required dimensional stability. Timken Company metallurgists came in, worked with DoALL's engineers and recommended a change from the bar stock previsously used to Timken® seamless steel tubing.

Immediate savings resulted. Machining time was cut. With Timken seamless tubing, the hole was already there. No drilling required. Scrap loss reduced. More parts produced per ton of steel. One of the annealing operations required with bar stock was eliminated.

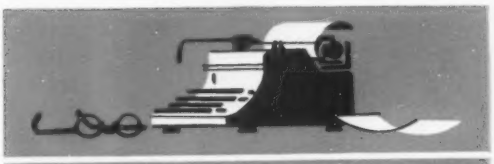
DoALL and Timken Company metallurgists devised stress-relieving operations to insure complete stability in the finished part. By changing to Timken seamless steel tubing, DoALL's production cost per housing was cut 26% and thorough lab tests proved there were no dimensional changes in the finished part.

Timken Company metallurgists will gladly work with you on your hollow cylindrical parts jobs, to help you make important production savings with Timken seamless steel tubing. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



NEWS SECTION

NEGOTIATIONS: Will Joint Talks Work Out?

Steel's Big Three agree to joint negotiations . . . Industrywide bargain question raised . . . 60-day notices to union raise legal problems for future . . . McDonald's terms may be too high—*By Tom Campbell.*

◆ THE "BIG THREE" of the steel industry—U. S. Steel, Republic and Bethlehem — took an unprecented step as wage negotiations with the steelworkers opened. They agreed to accept David McDonald's suggestions that they meet with the steel union "crash" committee in an attempt to streamline what could have become a cumbersome period.

The step was unprecedented because only in cases where the government has demanded it have similar arrangements been made in the past. There was no government persuasion this time.

John Stephens, U. S. Steel's industrial relations vice president, took great pains to point out that the meetings this week are not "industrywide" bargaining. But impartial observers are not so sure. The three steel companies represent about 55 pct of the industry's capacity. Other company meetings are being sidetracked to see what happens in New York—where the meetings are now being held.

Major Point

In the industry it is generally agreed that David McDonald, Steelworkers' chief, now has his foot in the door for industry-wide bargaining. He has always advocated it; now he has it physically —but not yet legally. This by-play is as important as the demands the steel firms and the union will kick around.

It all goes back to the 60 day notices posted by the steel firms to insure what they consider is their right to close their plants in case the union should strike one or two companies. But there is a legal fly in this ointment.

Some National Labor Relations Board rulings have indicated that it is unfair labor practice to shut down (lockout) a plant that is not struck. And some courts have upheld this view. Others have denied that such a move is an unfair labor practice. Result: the whole question of legal lockouts is up in the air at present.

Legal Opinion

This simultaneous bargaining in the same room by three steel firms is not, according to the legal brains, industrywide bargaining. Arthur J. Goldberg, the steel union's counsel, has laughingly called it "joint and several." This is lawyer's jargon for indicating that you are acting as an individual and as a group at the same time; reserving your rights in each category.

But this cloistered legal lingo may at some future date turn up to bother either one or the other side—or both. But at present it means that the meetings will get down to steel tacks in a hurry. Most industry sources were publicly claiming last week that the odds favored no strike and union sources were spreading this good cheer too.

But behind the scenes in both

Utopia, Here We Come

The United Steel Workers handed an imposing list of demands to major steel firms at the start of contract negotiations. They include:

- **Wages: "Substantial" increase.**
- **Supplemental Unemployment Benefits: Five cents an hour to finance 52-week plan providing 65 pct of take home pay during layoffs.**
- **Weekend Pay: Time and a half for Saturday, double time for Sunday, as such.**
- **Shift Premiums: 5 pct of base pay for second shift, 10 pct for third shift, compared with present 6 and 9 cents per hr.**
- **Reporting Pays Eight hours.**
- **Vacations: One week for one year, two weeks for two years, three weeks for five years, and four weeks for 15 years. Also, two more paid holidays.**
- **Incentives: "Equitable" incentives for all employees.**
- **Social Insurance: Employers to foot entire bill, compared with present half-and-half arrangement on 9 cent hourly cost. Also: $5000 life insurance, compared with present $3700; sickness and accident payments to 65 pct of weekly take home pay, with minimum of $50; diagnostic care and unlimited stay.**

camps there was not the jolly feeling that it was a cinch for agreement well before the June 30 deadline. David McDonald wants it that way—on his own terms. Not only has he taken the spotlight as an enlightened and statesman-like labor leader; he is acting like one —this week.

Politics Too

Steel leaders are in a quandary since they too have as many face saving troubles as does Mr. McDonald. Should they decide to take a strike, they must quietly anticipate what damage such a stoppage would do to Republican chances for victory this November. The fast moving events in the past week—consolidated meetings and change of location—indicate that both sides would like to be spared the need for strike decisions.

All of which brings us down to: "What is the outlook?" This week it is hard to say. But if the meetings drag along to the latter part of this month, then most anything can happen. By that time the affable and even-tempered bargainers can quickly become subject to highly emotional issues. The millenium has not been reached in steel negotiations.

Back Room Talk?

Highly placed labor observers feel that both the union and U. S. Steel have had private talks about the unemployment benefit plan. U. S. Steel officials declined to admit such meetings have been held. They have merely pointed to the contract which provides for private talks when and if necessary. Obviously they were necessary this time.

The New York meetings will place two of the steel firms close to their chief executive officers and to their boards of directors. Also it is believed that the steel companies feel they will not be subject to as much front page "speculation" as has been common when the meetings have been held in Pittsburgh.

Old timers in the labor negotiations game see the long list of union demands as the best and biggest piece of window dressing in the history of the steel union (see editorial, p. 7). These same people also feel that Dave McDonald will not try the "divide and conquer" technique this year. But they believe that since it has been under study for the past year by union bigwigs, it could be trotted out some time in the future. After all, it succeeded in 1949; in a very limited way.

Professional guesses on the steel settlement by Pittsburgh, New York and Washington industry-labor experts range from 15¢ an hour to 20¢ with the critical strike point somewhere around 20¢.

McDonald's Terms

Most professional negotiators feel that Mr. McDonald would throw everything overboard if he could get quickly the SUB and a "substantial" wage increase. Such an agreement would give prestige because of the 52 week SUB (better than Detroit). A "big" wage increase would temper the feelings of those rank and file workers who don't appear to give a hoot for SUB. In any case the price of steel is going up sharply after negotiations are completed.

Reprints: Individual copies of this article are available as long as the supply lasts. Write Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Labor:

Company and union set up joint foundation.

A common sense approach to union - management responsibility for proper development of collectively-bargained health and welfare programs has been taken by U. S. Industries, Inc., and the AFL-CIO Independent Assn. of Machinists.

The company and the union have set up a jointly-financed labor-management foundation, first of its kind, to (1) develop and broaden the range of benefits, (2) learn how to make them available at the lowest cost, and (3) determine how to run the programs efficiently.

The Foundation on Collectively-Bargained Health and Welfare Plans will be headed up by Al Hayes, president of IAM, and John I. Snyder, Jr., president and chairman of U. S. Industries. Offices with full-time staffs and consultants are being set up in New York City and Washington. Initial investment will be $25,000 each.

"We believe that good health is good business," says Messrs. Hayes and Snyder. "The values to the worker of a broadened health and welfare plan are obvious. The advantages to the employer, in reduced absenteeism, improved morale, increased efficiency and greater productivity are virtually inestimable."

While primary aim of the foundation is to guide IAM and U. S. Industries in their collective bargaining for 5000 employes in four states, results of the studies will be made available to other companies and labor organizations as a public service.

Some 12 million U. S. workers are covered by collectively-bargained health and welfare programs and pension funds. These programs cost an estimated $5 billion a year, with reserves of more than $20 billion.

U. S. Industries is perhaps the nation's outstanding example of a company that pulled itself up by its own bootstraps by diversification. It originally was in the business of manufacturing railroad cars, a feast-and-famine industry. Mr. Snyder saw the handwriting on the wall and branched out into more stable fields. Eventually, the company diversified itself completely out of the railroad car business.

Easier Financing?

The Small Business Administration is making it easier and faster for smaller firms to secure funds under the limited loan participation program.

In an action stemming in part from the shortage of risk capital caused by tight money policies, SBA will permit its 22 branch offices across the country to give final approval to loans under the program without an OK from the Washington headquarters.

BRASS MILLS: Seek the Silver Lining

Business in a slump . . . Detroit considered factor . . . Depends on how much a mill usually sells to auto industry as to how bad it hurts . . . Mills confident for fourth quarter—By G. G. Carr.

◆ BRASS MILL business is bad. And Detroit is the degree determining factor. If a mill's auto orders are normally small, things are a little bit slow. If they are usually big, the mill is hurting.

Most mills are operating on a 4-day week, with layoffs of 50-100 workers not uncommon. Some mills, including several of the biggest, have thus far avoided short weeks by closing down for Memorial Day and staying closed until Monday. But there is universal agreement that May brought storm clouds.

Overall, Detroit accounts for about 20 pct of the industry's business. But the company-by-company share is spotty.

Not All One Basket

And there are other headaches. Many customers are living off inventories as much as possible, in hope of lower prices. London Metals Exchange and custom smelter prices have skidded sharply in recent weeks, and many expect a cut in the price of producers metal towards the end of June.

Most brass mills actually are not too worried, are confident of an order upturn this summer. Some speak confidently of full production schedules by July 1. They base their optimism on one or more of these factors: (1) Strong possibility of lower copper—hence lower brass mill product prices—just what many are waiting for. (2) Current depletion of customer's inventories. (3) Continued high operating rates of non-automotive customers, especially construction, electronics and electrical machinery industries. (4) Upturn in auto sales through either (a) better warm weather buying of '56 models (b) a '57 model sales spurt. (5) Imminent danger of labor troubles at the copper mines and smelters this summer.

Labor

The labor situation is worthy of special attention. Contracts between major domestic producers and unions expire June 30. In addition, United Steelworkers is making an aggressive bid to take over from Mine, Mill & Smelter Workers. This potent brew guarantees hot negotiating sessions, could very easily bring on a major strike. If this comes brass mills will be swamped with orders at any price.

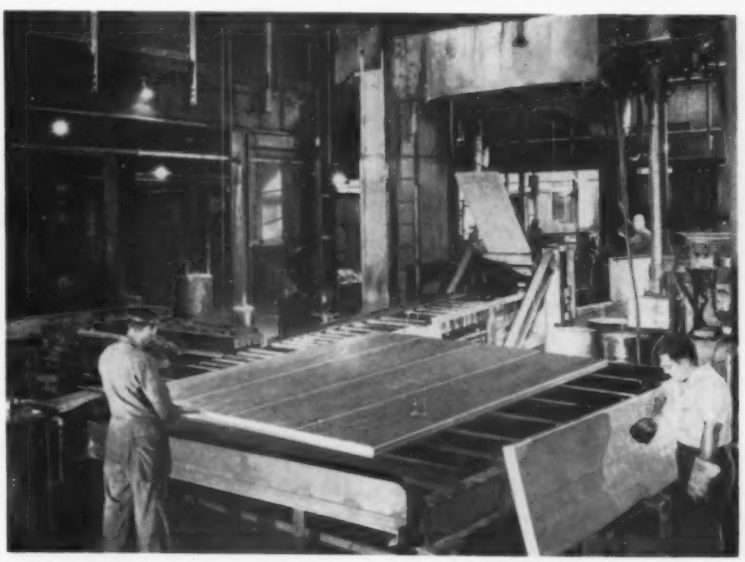
In the meantime, many mills say they will be cushioned against worst effects of a third-quarter slump by regular vacation plant shutdowns. There is some difference of opinion as to just when the pickup will come. But everyone agrees that the industry will enter fourth quarter at full throttle. And the current slump, while regretted, is not causing panic.

"Inevitable readjustment" is the way one mill describes it. Another refers to the auto cutbacks as "very temporary." And a third reports, "We are going right ahead with our expansion plans."

Immediate Action

Only real worry seems to be that autos might not recover exactly as hoped. But general opinion is that such an occurrence would mean an overall industrial slump, which most mills don't consider probable.

Some mills are attempting immediate action by aggressively pushing their fabricating divisions to help soak up mill output. These fabricating divisions are proving a hefty cushion plus a good foot in the door to diversification.



WITH ORDERS off, brass mills are reducing their production. But equipment, like this continuous flat-metal casting machine at Scovill Manufacturing Co., is kept well oiled in anticipation of a solid fourth quarter.

ECONOMY: Don't Give Up The Ship

Lag in consumer goods and home building has slowed the boom . . . But undercurrent of strength in other fields promises pickup . . . Politics will play role in resurgence . . . Easier credit seen—*By Tom Campbell.*

TOM CAMPBELL checks heat at Kaiser Steel's Fontana, Calif., plant.

Taking Industry's Temperature

- **Since late last February Tom Campbell, Iron Age editor-in-chief, has traveled more than 9900 miles taking the pulse of metalworking.**
- **He has been to Chicago, Cleveland, Pittsburgh, Rochester, N. Y., San Diego, Los Angeles, San Francisco, Denver, Pueblo, Colo., and Washington, D. C.**
- **Steel, aluminum, copper, machine tools, machinery, mining, and construction were a few of the subjects he talked over with more than 100 of Iron Age's metalworking friends.**
- **In this brief report are the high spots, hopes, and expectations of things to come—at a time when some are looking for big bumps in the economy.**

◆ DON'T RUN FOR the storm cellar yet. And don't batten down the industrial hatches. You could be very sorry if you do. The current crop of gloomy business news that is panicking some people is not being properly related to the whole picture.

That there is less confidence than there was a couple of months ago is a fact. But it is also true that underlying business conditions often—and usually—carry more weight than the ups and downs in the "confidence" of the business community.

But that still doesn't answer the questions, "Is this the real thing?" or, "Are we heading into a serious recession?" Some people—quite a few in fact—seem to be driven to look for negative news. It is a compulsion with some; like looking for a ghost.

Right off the bat let's say that the evidence is not here for a serious recession, for a deep depression or for a 1954 type strike in overall industrial buying. But let's admit that, on the surface, it might look that way.

Conditions throughout the country are not standard or stereotyped. They are quite different—in different parts of the country; and in various industries. Those fields that are well known to everyone—appliances, autos, and home building—are having their comeupance. And because they are household words their changes in activity carry more impact—probably more than is warranted.

Business: + and − Factors:

◆ **IN THE present business outlook, short term and long term factors are a little intertwined. It may be that some becloud each other. But the plus signs outweigh the minus signs—even though the latter are getting a better hearing. Here they are:**

MINUS SIGNS:

Auto sales and output are lower than most realists had expected. Cold weather, credit, and selling this year's cars last year are responsible. Housing starts were frozen out by the weather—and by credit restrictions. Those lost cannot be made up—this year at least.

Inventories are heavy because people hedged against a strike and price increase in steel and aluminum. If there is no strike, some will live off inventories.

Then the Federal Reserve Board put in its two cents worth by tightening credit and raising the interest rate; this in turn hit the confidence boom. Now comes the summer "shutdown."

PLUS SIGNS:

Plant and equipment spending by industry this year will top $38 billion—up more than $9 billion

INDUSTRIALISTS Robert T. Keller, left, Chrysler Corp., and Earle V. Grover, right, president of American Institute of Steel Construction, discuss business conditions with Iron Age editor-in-chief at Los Angeles.

Probably the biggest surprise to the optimists have been the sagging auto sales figures and the heavy cutbacks in auto production. We are used to seeing the auto industry carry us to new peaks in activity. Because this year's performance will not match the all-time and wholly unexpected 1955 sales year, business confidence is taking a nose dive in some circles.

The drop in auto output has hit the paint people, the rubber makers, steel producers and a host of other manufacturers and suppliers. But is this reason enough to look with fear at the two or three months shakeout period through which the economy is now going? Hardly!

Although it might be considered as an alibi in some circles, it is a fact that weather has played hob with the auto business and with housing starts this year. It is also true that a lot of people have been up to their ears in installment payments and will not be out of the woods for a few more months.

The Other Side

Those conditions had as much to do with the drop in auto sales and home starts as did the selling last year of what "ought to have been sold this year." But the harping on these depressed—as related to all-time peaks—areas, has overlooked the whole economic picture. The economy is not and will not be as bad as painted.

There are now going forward in this country at least five big and major expansion programs; the greatest in recent years. They will not be stopped and little or no changes will come about in plans already made. Let's name them: steel, oil and gas, auto manufacture and assembly, aircraft (commercial) and public utilities (including the $2 billion Bell Telephone expansion).

Not mentioned in that basic list but which are also quietly propping up the economy are: freight car building and repair, home modernization, and vacation-play business. But let's take a look at some of the not-so-clear business deterrents in the short term picture.

We have mentioned the weather. It has been a serious factor in slowing up home building, flooding out some areas, killing off agriculture in some farm sections—and has lost millions of dollars to the textile and clothing industries. Many of these losses may be merely delayed buying and will show up as new expenditures at a later date; but probably as other "desires" such as a 1957 auto instead of a 1956 model.

The tightness in money and credit has hit the home market hard and has caused some people to be turned down as a credit risk. It has hit installment buying as well. The increase in the interest rate five times in one year by the Federal Reserve Board may have been for the best "interest" of the country. But there are serious doubts about the timing of the most recent move. So much so that relief is being rushed before June 15. Also the "Fed" is quietly—and quickly—backtracking on its hard money attitude.

Bad Weather Hurt

The almost total lack of spring in many parts of the country has seriously affected seasonal influences. This factor "belongs" under weather but it is so outstanding this year that it must be considered as contributing to many of the consumer goods changes.

The building of metals and machinery inventories has been roaring along at a breakneck pace for months on end. The sharp upward movement had to slow down sometime. It has. But it hasn't stopped dead in its tracks; nor is it likely to.

The economy has been getting ready for a short rest and will be aided and abetted this summer by

from 1955. Auto sales in last three months will be up over present levels; housing is on its way up (starts may be lower but total housing expenditures are not down as much).

Industrial construction is booming. The Federal road program is coming. Defense spending is on the rise. Major expansions are not being curtailed. The growth factors are alive and kicking.

The Federal Reserve will make much more credit (money) available this month and will probably change its stiff outlook.

All Of Which Means: Be sure you do not crawl into a hole and pull the cover in after you. It might cost you money, business, and a good disposition.

one of the biggest mass vacations periods in modern industrial history. That can mean—and probably will mean — that many machines, furnaces, mills, and market places will be shut down tight as employees—and employers—seek domestic and international playgrounds.

The Long View

Then we have "talk." Right now it is having its effect on business, the stock market—and on the politicians. Before we are through, this phony slideoff in business (by phony we mean that some people are mis-labeling it a recession) the wailing wall will be visited by a fairly large segment of industry.

So much for the near-term picture. But what about the not-so-near-term picture? Are the under currents in the economy strong enough to throw off the temporary weakness in the consumer goods outlook? Will the layoffs in farm implements, autos, and appliances set off a chain reaction? We think not, based on our travels and talk with those in all parts of the country whose business it is to watch closely the industrial trends.

For those in the East it is hard to visualize the vitality and growth in the Farwest. You have to see it to believe it. But the crash missile program, the general growth of that area, and the sudden appearance of the jet age for commercial planes are piling up demand, production, and labor shortages every day in the week.

Then turn to the Rocky Mountain area with Denver as the center of the hub and you see a growth and an activity that belies any feeling of doom and gloom in the months to come. Stretching from Canada to Mexico this area is continuing the growth started some years ago. Today there is no sign at all of any slow-up in the rate of expansion.

Machinery Boom

In the Southeast and Southwest the number of new businesses, the mushrooming of demand, and the spread of purchasing power and employment are not slowing up. Steel, aluminum, appliances, machinery, electrical, and electronic materials and long pentup demand are still on the move—this week; with no sign of any "real" backtracking.

Latest area to show new stirrings of expansions and the coming St. Lawrence Seaway boom is the Western New York—Northern Ohio—Northwestern Pennsylvania area. Machinery, furnaces, power plants, and other heavy industry orders are pouring into that area as well as into Pittsburgh.

That means that some areas of the economy are working at higher levels than are others. It means, too, that this summer plants that can ill afford to be shut down will go down for vacations. When these shutdown periods are over there will be a rush for production and materials to a greater extent than there has been.

What about this so-called plant and equipment spending? Last year it was $28.7 billion. The year before (1954) it was slightly more than $26 billion. What is it slated for this year? Hold on to your hat — conservative figures indicate $35 billion will be spent by all industry this year for plant and equipment. But based on visits and analysis of government studies, this writer believes that when all the figures are in, the 1956 expenditures will come closer to $38 billion.

Defense Impact

The coming steel wage hike followed by a similar pattern in other industries means one thing, loud and clear—more plant and more machinery will have to be built and purchased in 1957 if wage costs are to be supported and earnings remain unaffected.

Turning to the defense picture, it is not warmongering to point out that to prevent wars we must spend more for defense. The crash programs on missiles are only the start of a vast program, the cost of which will stagger the imagination. The stepup in long range bombers has only started and will gain speed as the knowledge dawns on Washington that many of our bases are as good as neutralized because of nationalistic and communistic actions.

By the end of this month defense spending will have run to about $34.5 billion for this fiscal year. But in the fiscal year 1957 starting July 1, we will be conservative if we estimate an expenditure of $36.2 billion for defense, an increase of $1.7 billion. And it will have to be done quickly if we are to pick up our lost motion in the race with the Communists.

It would be ridiculous to assume that politics do not play a part in the economic picture. This week

Help For Small Business

President Eisenhower says he does not intend to stand idly by and let small business go down the drain. He tells his top White House advisers to get busy and extend a meaningful program of aid that will put more muscle into the economic life of the nation's 4 million smaller firms.

Although the Federal government has operated scores of so-called small business aid programs over the years, this is the first time the problem of how to keep small business healthy has come up for close inspection by any president.

Ike picks Dr. Arthur F. Burns, chairman of his Council of Economic Advisers, to head up the new assistance program. Other members are the secretaries of Defense, Commerce, and Labor; Dr. Arthur S. Flemming, director of defense mobilization; Small Business Administrator Wendell B. Barnes, and Housing Administrator Albert M. Cole.

The new White House program is a direct reflection of the grave concern—both in and out of Washington—over the continually declining fortunes of smaller firms.

you can be sure that the Administration's practical boys are eyeing the business horizon with some misgivings. That frame of mind will speed farm relief, produce quick action on the road program —when passed—and will put the full machinery of the party towards shoring up the prosperity that means so much in an election year.

The Outlook

Of far more importance and less in evidence this week is the dynamic growth of the United States.

For a good many years the birth rate seems destined to hover around 4 million a year. Machinery and electronic advances bid well to cut further the cost of production and increase the output per worker. This does not mean pie in the sky forever. There will be adjustments. But there will be more adjustments in looking for greater industrial activity than there will be adjustments in lowering our long term sights.

Coming back to the picture for the immediate future: there will be a short lived slump in confidence, in the summer purchase of materials and there will be a paring of some inventories. But unless there is something wrong in Denmark — which there isn't — there is a strong enough base for the economy to predict without any qualms a healthy resumption soon of consumer durables activity and a continuation at higher levels in output of producers' goods.

Lest it be overlooked it will be good for you to recall that the final figures on spending by the man-on-the-street in 1954 showed he had far less fears than did the captains of industry. He is still the same man, impelled by his belief that conditions are pretty good, that his job is safe and that there are a lot of things he wants —and expects to get; somehow.

And P.S.: a steel strike will but postpone—not wipe out—the improved business picture to come.

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PERSONNEL

SALESMEN: Court 'Em In Field

It pays off to meet salesmen in the field . . . Management visits to territories bring results . . . Some combine home and field sessions—*By G. J. McManus.*

◆ STRANGERS DON'T make the best salesmen. Alert management groups are finding it pays to get acquainted with the field force all the way down the line. They're spending big money to step up personal contact between the home office and district men.

Trend is toward working with smaller groups. Pittsburgh Steel Co. has started a program of field sales meetings to take the place of a general annual meeting at the home office. The company sends out a 13-man team made up of production planning and top sales executives. The group spends two days in each of the districts.

Why It Pays

The company feels this type of meeting has definite advantages over one attended by all districts and held at a central point.

For one thing, it is possible to concentrate on the particular problems of the district visited. Secondly, the small size of the group gives everyone a chance to air his views and ask questions. And in a small group, salesmen can get to know product managers and vice versa.

Jones & Laughlin Steel Corp. holds an annual meeting of district sales managers in Pittsburgh and sends top sales executives out for regular meetings in the field. In addition, J & L began this April a program of bringing salesmen into the home office for refresher sessions.

Management Profits

"It's like a shot in the arm," says Karl Brunt, coordinator of training and recruitment at J & L. The salesman watches steel being rolled, gets a clear picture of the profit considerations and delivery problems for different grades. He talks to men he has known only as voices on the telephone or names on letters.

Firth Sterling, Inc., is equally pleased with the results of its home training program. Makers of tool steel and sintered carbide products, Firth Sterling began in 1954 to bring salesmen, distributors, and carbide service people into Pittsburgh for training sessions. Program calls for each salesman to be brought in for one week at least once every 18 months. Distributor salesmen are offered three-day sessions.

A company spokesman referred to the lift these meetings give field people. He said one relatively new man went out from the training program and won a district sales contest. Another went out and cracked an account the company has been trying to land for years.

To keep salesmen up-to-date while they're in the field, Firth Sterling sends out monthly quizzes. These are filled in by the salesmen, graded at the home office, then rehashed at regular district meetings.

Money Well Spent

"We send sales bulletins to the man's home," said one product man. "That's so he'll have time to read them. But we know we're competing there against golf or his wife's plans for him. And if he does read a bulletin, he has no way of asking questions."

Two-way communications are what companies want today. The only way to be sure of it with a salesman is by having face-to-face contact. It costs money to send management out or to bring field people in but the expense is a necessary one.

PRODUCTION

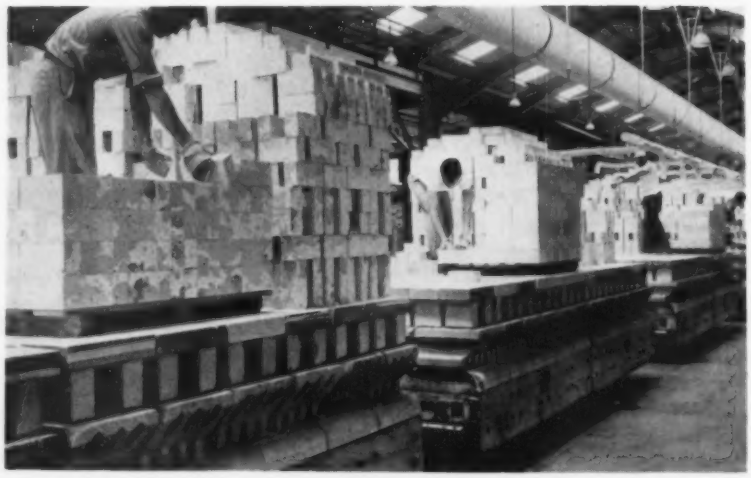
REFRACTORIES: Slumping into a Record

Inevitable slight slump won't prevent record year . . . Steelmaking and other major customers are still strong . . . Confident industry plans expansion with favorable future markets—*By K. W. Bennett.*

◆ REFRACTORIES producers are beginning to sense a slackening in demand. Tied closely with the ups and downs of the steel industry (50-55 pct of U. S. refractory material is consumed by iron and steel producers), nonetheless refractory men agreed that if there is a slowing in consumer demand for refractories, it isn't coming from basic steel.

Despite the negotiating period, steel companies are continuing to absorb refractory materials in heavy quantity, and the weakness is mainly due to automotive cutbacks, and recently, a slowdown in refractory buying by industry. It's no slide, there's no evidence of panic, but since mid-May there've been an increasing number of hold orders from customers, sprinkled with a handful of outright order cancellations.

Normally, refractory sales hold until July or late June, then begin a seasonal decline that is erased in September as the entire industrial machine picks up momentum. The slowdown seems unseasonally early this year.



ALTHOUGH orders for refractories, like this fired brick at Leslie, Md., plant of Harbison-Walker, are off, the high volume of business done before the downtrend will probably carry the industry to record year.

Seasonal Factors

Even with a slowdown in June and on through September, refractories could enjoy the best selling year in the industry's history. Sales began to rise in later 1954, went sailing through 1955 at capacity operations with many companies reporting no seasonal slowdown whatever during July and August, and continued to climb until last December and January. At that point, a good cross section of the largest firms in the industry hit a sales pace that held solidly right through until May. At least one company's earnings were 50 pct ahead of the like 1955 period in the first three months of 1956.

It's safe to assume that industry sales for the first five months of the year were 20 pct ahead, on the average, of sales in the same period of 1955, and 1955 was a very good year. The industry has been gaining ground since 1949. In that year refractory sales were estimated at $184,000,000. By 1953 the sales level had hit $324,000,000 and these figures are regarded as conservative. Brick & Clay Record figures industry fell off in 1954 and advanced to $333,000,000 in 1955. The Department of Commerce and the Record don't agree (annual tabulations differ by as much as 20 pct), but both indicate a major advance in industry volume over the past five years.

The industry will get bigger. Of about 125 producers is the U. S., the larger producers include Harbison-Walker (about 25 pct of total refractory output); General Refractories; A. P. Green; Mexico Refractories Co.; North American Refractories Co.; Laclede-Christy Co.; and just about every one of these concerns has announced expansion plans or is already in the process. Nearly all are expanding their facilities. Harbison-Walker will erect two new plants and a lab; A. P. Green has a lab expansion; Mexico has installed a new tunnel kiln that will up capacity by 20 pct; North American is reported "continuing to expand"; General Refractories is building a plant; Laclede-Christy is embarking on a $1.5 million expansion; Marblehead Lime is building a new lab building at Chicago.

What does the slowdown mean? A majority of refractory men expect that 1956, like 1953, will have completed such a good first half that, whatever the state of third quarter business, the industry will beat record 1955 this year.

Roads:

Congress planning expanded program

Vastly expanded highway construction program in 1956 looms as a certainty as House and Senate conferees place in final form the text of the road bill for President Eisenhower's signature.

Both House and Senate versions of this measure commit the Federal government to provide $25 billion for super-thoroughfares in the interstate highway system. The House, however, approves a 13-year program for all roads involving use of Federal funds, while the Senate narrows the 13-year time schedule to the interstate road net.

Result is that the total cost of the House-backed program would be $51.5 billion, compared with about $37 billion for the Senate version.

Another involves the distribution of the $25 billion for interstate roads. While the House would allot the funds on the basis of state estimates of needs, the Senate votes to stick with the present formula wherein state size, population, and rural road mileage determine the apportionment.

Each version contains a plan for raising much of the new Federal road funds. Higher levies on gas and diesel fuel, tires, retread rubber, trucks, trailers, and buses would bring in over $14 billion of the required total.

Coke:

$5 million for 4 new batteries

Republic Steel Corp. will spend $5 million to rebuild four coke oven batteries at its Cleveland plant.

Work will commence immediately on the initial battery, which will be completed before second battery is torn down and rebuilt. Work on each battery is expected to take about 12 months, with the entire project running close to 5 years.

Ovens will be dismantled right down to the pad or base. New regenerators will be built on the pads to preheat the air used in underfiring the ovens.

Height of the new units will be about 26½ ft. Each battery will be 200 ft long and 37 ft deep. The Kopper design units will be narrower and higher than their predecessors, boosting capacity by about 15 pct.

Stock equipment will be self-sealing doors with stainless steel edges. And each battery will have double collecting mains to capture and transport coke gases.

Program will also include increasing the size of the quenching tower from 47 ft to 175 ft, coke wharf to be extended, two new mixer bins will be built, and coal storage bin above the ovens will be elevated.

Expansion Briefs

Sterling Die Div., Pratt & Whitney Co., Inc.; producers of thread rolling dies; new plant in Cleveland ready for occupancy in October.

Caterpillar Tractor Co., Peoria, Ill.; new motor grader and wheel-type tractor plant dedicated at Decatur, Ill.; claimed to be the largest of its kind in world.

Continental-Diamond Fibre Div., Budd Co., Newark, Del.; constructing new buildings at Bridgeport, Pa., for production of continuously made vulcanized fibre; increase production 30 pct; ready to occupy Sept.; cost about $600,000.

General Electric, Schenectady; new plant for rectifier dept.; will move from Lynn, Mass., to Lynchburg, Va., when plant is completed; move expected 1957.

Lunkenheimer Co., Cincinnati; valve manufacturer; new plant for production of iron and steel valves.

Allegheny Ludlum Steel Corp., Pittsburgh; has agreed to sell technical knowledge and patent rights for production of consumable electrode vacuum remelting of steel, to **Midvale-Heppenstall Co.,** Philadelphia, Pa.

Fluor Corp., Ltd.; awarded contract for construction of butadiene plant for Odessa Butadiene Co., Odessa, Tex.

Lindberg Steel Treating Co., Melrose Park, Ill.; addition to current plant; cost about $250,000.

Carborundum Co., Niagara Falls, N. Y.; extension of silicon carbide furnace plant; Vancouver, Wash.; increase capacity 16 pct.

$85 Million Nickel

Freeport Sulphur Co. will spend about $85 million to build a new nickel and cobalt processing plant in the south, probably in one of the states with a port on the Gulf of Mexico.

Another part of the company's expansion plan calls for enlarging its mining operations in Cuba and acceleration of the now-in-progress construction of a pilot plant at Braithwaite, La.

INTERNATIONAL

Red-Bloc Divides Export Markets

Exclusive rights to Free World markets parceled behind Iron Curtain . . . NATO responds with counter-foreign trade program . . . Satellite machinery will help tool West German Army, equip Chinese mills.

◆ IRON CURTAIN countries are concentrating their combined export efforts on gaining a trade advantage over non-communist nations, Lord Ismay, Secretary General of NATO, revealed. Iron, steel, and machinery are playing an important part in the Red program.

"The penetration covers the whole field of export markets," stated Lord Ismay. "It is much the same whether you deliver a tank, tool, or a banana."

It seems certain that Moscow and her satellites—including Red China—are carrying out the well-laid plan by dividing their export markets.

Many details of the Red plan are lacking, but it is known for certain that it consists of four major points:

1) No competition between Red-Bloc countries.

2) Maximum concentration on individual products by each country.

3) Division of markets.

4) Economic and financial cooperation.

In an effort to stem this move, NATO accepted a recommendation by U. S. Secretary of State John Foster Dulles for "more amplified economic and political cooperation," between nations of the Free World. But because of the nature of free enterprise, NATO would not try to match points 1, 2 and 3 in the Red program.

Here are some of the known details relating to ferrous markets and machinery in the Red plan:

Pig Iron . . . The USSR has exclusive export rights to Free World nations. Sales include foundry iron, spiegeleisen, etc. One of the latest contracts called for shipment of 10,000 tons of foundry iron from the Donetz district of Ukrania to Liverpool via the Black Sea-Danube-Rhine River route.

Merchant Bars . . . Poland has charge of this market with cooperation from East German industry. Shapes of all kinds are included.

Plate and Sheet . . . Czechoslovakia has exclusive rights to this market.

Semi-Finished Steel . . . Blooms, slabs, etc. are handled only by the USSR.

Wire Products . . . Hungary has this market to itself.

Alloy Steel . . . Controlled by Czechoslovakia.

Machine Tools . . . For heavy tools, Czechoslovakia is the sole exporter, while light tools are shipped by Hungary. No Russian, or Polish tools will be available in the near future. The Czech and Hungarian machine industry may include USSR products in their shipments, but these tools will be declared as either Czech or Hungarian. Last year, 48.3 pct of Czechoslovakia's total exports were machine tools and for the first quarter of 1956 it was up to 50.1 pct. The Hungarian machine tool industry has quintupled its output in 4 years. Even West Germany is reported buying tools from Hungary. Surprisingly, much of these are going to Rheinmetallwerke of Dusseldorf, which is producing armament for the new West German Army.

Other Machinery . . . Mining machinery, Czechoslovakia; oil drilling equipment, USSR; textile machinery, Poland.

The new Communist foreign trade setup does not include inter Red-Bloc trade. China is hoping to produce 4 million metric tons of steel in 1956, and probably will realize that goal.

Steel prices behind the Iron Curtain will go up for domestic and export sales. In Austria, for example, a 20-25 pct rise in domestic and 10-15 pct rise in export prices is almost certain. The big question is whether the rest of the Red-Bloc will follow suit. If they don't, Communist exporters are expected to be flooded with orders. And this situation is causing NATO no little concern. Since the division of export activities has gone into effect, shipment times rapidly are being cut. But they still exceed Western shipment times. Machinery exhibited at recent trade fairs in Leipzig and Vienna was offered at shipment times almost double that offered by Western manufacturers. This is offset by lower prices for East-Bloc machinery.

Pullman To Moscow, Anyone?

▪ Russian engineers are dreaming of a railroad linking the U. S. and USSR via a 50-mile dam across the Bering Strait. The dreams — or nightmares — are inspired by the Kremlin's new peace offensive.

▪ Alexander I. Zinchuk, first secretary of the Soviet Embassy, visualized the dam as a "colossal hot water bottle" that would warm up Siberia and Alaska.

▪ Users of the railroad should be advised in advance that round trip tickets may be hard to come by. And no stock would be sold in the project, the envoy said. So don't be in a hurry to cash in your AT&T or GM gilt-edge bonds.

NEW director of the Iron and Steel Div., Business and Defense Services Administration, is Leonard T. Willison, assistant general manager for sales of Jones & Laughlin Steel Corp.

Tanks Go Atomic

Tanks mounting guns that will fire atomic ammunition may be ready soon to provide the Army with greater tactical striking power.

Guarded testimony by Army spokesmen before Congress indicates that the new types of tanks will be built to handle atomic shells. This would be in keeping with plans to develop shells of conventional size that will carry atomic warheads.

First artillery piece adopted by the Army for firing atomic shells is the unwieldy 280 mm cannon. Ammunition for this gun is larger than standard size, and the decision has been made to concentrate on producing the new shells for smaller weapons, including the 8-in. howitzer. Existing heavy tanks are equipped with 120 mm guns.

Tanks that have gone into service in the past dozen years are to be replaced by new light, medium, and heavy armored vehicles of improved design. This equipment, besides having more powerful guns, is to be lighter and more efficient and have greater range.

New tanks are urgently needed to counter the arms modernization program opened by the Russians, Congress is told. Army research experts say the Reds are supplying their army with new weapons that range from light automatic to large atomic types.

Tax Relief:

ODM grants amortization increase to more firms

Aiming to expand private industry's productive capacity to meet mobilization goals, the Office of Defense Mobilization in May issued certificates of necessity for accelerated tax amortization to 75 corporations. The certificates totaled $204,196,450.

The tax amortization represents investment of private capital and does not involve investment of government funds, ODM emphasized.

Of the 75 certificates issued, 11 went to small businesses. These totaled $1,214,801 and are designed to encourage small defense plant expansion.

Among the largest certificates issued were $74,036,000 to Texas Eastern Transmission Corp., and $46,800,000 to U. S. Steel. Both were allowed 25 pct at the rapid depreciation rate. U. S. Steel's certificate previously was denied.

The majority of recipients were railroads, aircraft, oil, steel, power and electronics companies. With the new certificates granted, accelerated tax amortization amounting to more than $35.5 billion has been issued to 21,073 new or expanded facilities. About 60 pct of this total is eligible for rapid depreciation.

Unlike the situation during World War II, U. S. ownership of defense facilities now is being held to a minimum. To a great extent, this is being accomplished through the tax amortization program under the Revenue Act of 1950. The Act allows partial depreciation of plant and capital equipment during a five-year period. Previously, the depreciation rate varied up to 25 years.

UNIQUE BOMB BAY capsule is installed in Boeing B-52B enabeling the 8-jet global bomber to perform multiple strategic roles including photo reconnaissance, electronic missions and nuclear weapons delivery.

MANAGEMENT

ENGINEERS: Lure Them With Climate

Maine survey reveals that geography can be a selling point in attracting elusive engineer . . . Applicants swamp firm advertising Florida plant location . . . Survey details revealed—By G. G. Carr.

◆ YOU MAY CHUCKLE when you read the ads: "Engineers: Work in Sunny California (or Smog-Free Long Island)." But a new survey by the State of Maine suggests this is no laughing matter.

Maine's Dept. of Development of Industry & Commerce surveyed about 2000 recent graduates from the University of Maine's School of Technology who are now working in other states. From 803 replies, 598 or about 75 pct state definitely they would leave present jobs to return to Maine if comparable employment were available. Some indicated they would accept lower salaries if necessary.

Located Everywhere

The 598 favorable replies include electrical engineers, 133; mechanical engineers, 215; chemical engineers, 129; physicists and research men, 63; and civil engineers, 58. Industries represented include atomic research, aeronautics, automotive, chemical, electronics and electrical machinery, instruments, missile systems, nuclear weapons, plastics and rubber. Average age of the survey respondents is 33 years and they are currently located in almost every state but Maine.

Stopping Exodus

The state also ran a related series of newspaper advertisements in other New England States aimed at skilled workers who were formerly Maine residents. So far there have been over 500 replies to these ads, covering 47 different skills. Included in the replies were 34 supervisors and 22 college graduates. In addition, a substantial number of out-of-staters replied, offering to move to Maine.

The survey and ad campaign were originally undertaken as part of Maine's effort to attract industry. A frequent complaint was that Maine did not have enough technical brains and skills available to supply new industry. Conversely, Maine has for a long time worried that too many of its best brains were accompanying its lobsters, lumber and potatoes out of the state.

Maine is not alone in this problem. It is a standard complaint (and worry) throughout New England. A Bureau of Labor Statistics survey of 41,000 scientists in 1948 showed that almost 14 pct of PhD degrees and about 12.5 pct of the bachelor degrees were awarded in the region. (New England overall accounts for only about 6.3 pct of the country's population.) Yet only 8.1 pct of the 41,000 were employed in the area. Many would have liked to remain, but found better jobs elsewhere.

Maine Industrial Development Commissioner Louis Shapel reports that the survey results have prompted at least one major company to active consideration of a Maine site.

Follow the Sun

More proof of the importance of location comes from the other end of the country. An aircraft firm recently advertised for engineers to work in Florida. At the time, the company didn't even have a parking lot in that state. But when over 220 hot prospects had agreed to move, the firm started drawing up the plans for its Florida plant.

Obviously this doesn't mean that manufacturers should run travel agencies. But it does mean that your location can be an important selling point in recruiting hard-to-get personnel. For every outdoors type lured by the Maine woods there's an indoors type who's dying to move to (or near) the big city. Availability of labor has been a traditional factor in considering new plant sites. The Maine survey and other evidence suggests that "lureability" can play a role too.

AEC Baits Hook For Metallurgists

Metallurgists who are concerned with fission rather than fishin' are being sought by the Atomic Energy Commission in Washington, D. C.

The AEC has sent out distress calls for metallurgists having three to 10 years experience in industrial operations and atomic energy development work.

One of the job openings is for a man experienced in high temperature ceramics. Starting salaries for the positions range from $8,990 to $12,690 a year.

Applicants should contact George M. Gabelman, personnel operations branch, Atomic Energy Commission, Washington 25, D. C.

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REPORT TO MANAGEMENT

When Should Taxes Be Cut?

Now that a significant budget surplus is safely in the bag, clamor for tax cuts should be expected from every hand. Ordinarily, you would hear demands for relief of its own special group from every organization in or out of Washington.

Actually, the clamor isn't as loud as might be expected. Without stretching a point, one reason could be that the public has become accustomed to present rates, can't get excited over them any more.

But the real reason, besides resignation to the situation, is that responsible groups and individuals are more concerned over the economic stability of the economy.

This isn't a case against tax cuts. Far from it. But there isn't any point in slashing tax rates this year if it results in a deficit next year. You can't cut government income without instituting economies and methods to keep the budget balanced. There is a good case for obtaining some tax relief this year. But it should be done with the future in mind.

A Time for Long Term Thinking

One of the groups voicing this moderate opinion is the Committee for Economic Development, which has just completed a study of tax policies.

A decision to cut taxes should rest on "assurance, based on a conservative estimate of the prospective surplus, that a tax cut of reasonable size . . . will not result in a deficit in the cash budget in the fiscal year 1956-57," the Committee says.

The CED observes that if only a small surplus in 1957 is indicated, no tax cut should be made unless changing economic conditions require strong action to combat recession.

If tax cuts should come, the CED then recommends that priority should be given reduction of individual rates, especially those that are extremely high, but also in corporate profits taxes and in selective excises.

Surpluses too small for major tax cuts should be earmarked for debt reduction, a point that is pretty much in line with the current administration's policy.

A point to consider is the size of the surplus. The administration estimates it conservatively at $1.8 billion, in the administrative budget. But actual surplus in the cash budget may go as high at $4 to $4.5 billion. A tax cut of minimum size to have any significant relief value would have to be $2 billion.

Is the Building Boom Dead?

The answer is no, despite all the gloom talk that started when the annual rate dipped below 1.1 million new home starts. Although the rate is still low, experts maintain that more than 1.2 million homes will be started this year.

A big factor in the slow upturn is undoubtedly the policy of the Federal Reserve Board. Government guaranteed contracts, which account for so much of the new home building, provide for small down payments and low interest rates. The tight money market makes it increasingly difficult to arrange for this type of loan.

But changes in the tight money policy appear to be on the way. They should be followed by an upturn in home buying.

Return of the 30-year government guaranteed mortgage is also expected to take effect—if the money is available at specified rates.

INDUSTRIAL BRIEFS

Die Is Cast . . . Havill Corp., Los Angeles, diecasting firm, has acquired land in Santa Ana, Calif., for construction of new plant. Scheduled for completion in January, 1957, new plant will house diecasting facilities.

Clean Sweepdown . . . For outstanding cooperation with the Naval Reserve program, awards were presented to three industrial firms and one municipal government. Recipients of the Navy-sponsored Dept. of Defense Reserve awards are Weirton Steel Co., Weirton, W. Va.; Bell Aircraft Corp., Niagara Falls, N. Y.; and the Board of Commissioners, Port of Palm Beach, West Palm Beach, Fla.

Stainless Tenant . . . Air Reduction Co., Inc., will move its executive offices into the Socony-Mobil Bldg., New York.

Open For Business . . . A warehouse has been opened in Detroit by Beryllium Corp., Reading, Pa., stocking an extensive line of copper alloys, casting ingots, rod, bar and billets.

Don't Get Burned . . . Continental Coatings Corp. has been granted exclusive license to the "Flame Ceramics" process developed by the Armour Research Foundation of Illinois Institute of Technology for the application of ceramic coatings to base materials.

Top Ad . . . Award for the top public service advertisement given by Annual Awards Committee of the *Saturday Review of Literature* has been won by Caterpillar Tractor Co. "Ever Watch a Forest Die?", the advertisement was judged best of the 400 ads in national magazines submitted.

Good Old Days . . . Twin Coach Co. has received an order for 1000 "Pony Express" postal vehicles under a subcontracting agreement with Fargo Motors Div. of Chrysler Corp.

Carbon Copy . . . The Electrode Div. of Great Lakes Carbon Corp. plans to add more than 45 per cent to its annual capacity for production of carbon and graphite electrodes, anodes, mold stock, and graphite specialties. New facilities will be added at the division's plants in Morganton, N. C., and Niagara Falls, N. Y., and are scheduled for completion in May of 1957.

Scoring After Strike . . . Westinghouse appliance production at Mansfield and Columbus, O., has climbed 35 per cent ahead of the pre-strike levels. Employment at the two plants is nearly 1500 above what it was before the shutdown.

Floating Pump . . . Dravo Corp., Pittsburgh, is constructing a floating pumping station to supply process water for Ford Motor Co.'s glass plant in Nashville, Tenn. The facility, designed for automatic and continuous operation regardless of river elevation, consists of a welded steel barge moored between four steel sheet pile cells. Four pumps are driven by electric motors while the fifth is diesel-powered in case of electric failure. Electric pumps have a capacity of 4,000 gallons per minute and the standby diesel pump is rated at 2,500 gallons per minute.

First Grand . . . Ford Aircraft Engine Div., Chicago, has completed its 1000th J-57 turbojet engine for the U. S. Air Force.

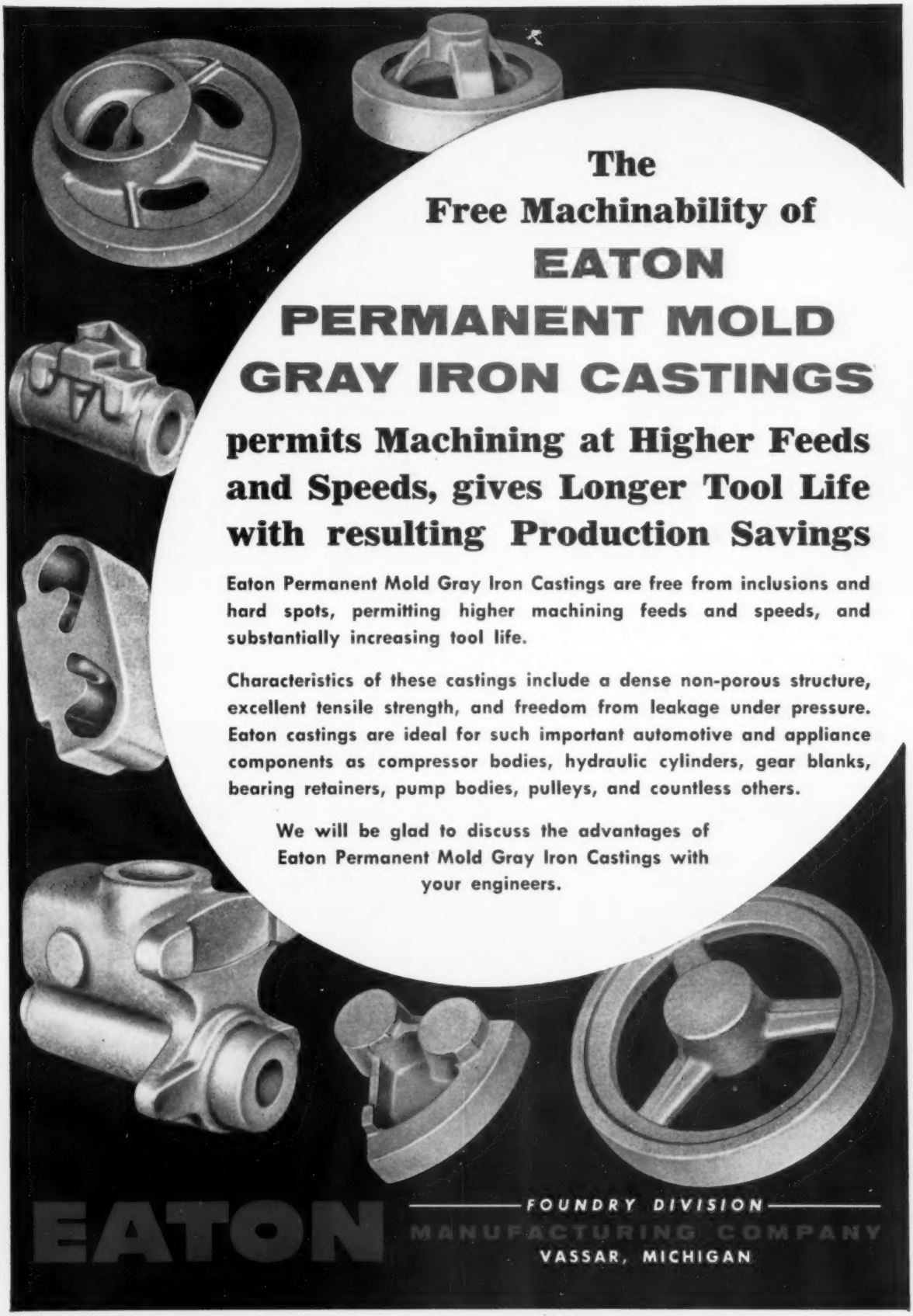
A Fast Buck . . . One of the first known prefabricated drive-in banks was opened in Louisville, Ky. Structure was designed and built by U. S. Steel Homes, Inc., the housing subsidiary of U. S. Steel Corp.

Beat the Heat . . . General Refractories Co. is planning to build a refractory manufacturing works at Gary, Ind., to produce bonded basic brick, mortars, castables and other specialty products.

New England Move . . . Vulcan Crucible Steel Div., H. K. Porter Co., Inc., has appointed Bridgeport Steel Co., Milford, Conn., distributor for its products in the entire state of Connecticut.

Bought and Sold . . . American Cyanamid Co. and The New Jersey Zinc Co. have made effective agreement of sale entered in March 1954 with the turning over to the zinc company of Cyanamid's Gloucester City, N. J., titanium dioxide pigments plant.

Servicing for Sales . . . District offices for sales and service of ultrasonic inspection instruments and machine protection devices have been opened on the West Coast and Southwest by Sperry Products, Inc., of Danbury, Conn.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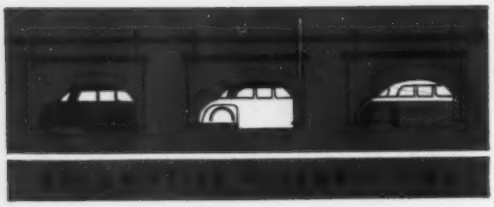


Labor Girds For 30-Hr Workweek Fight

UAW Council planning early for 1958 contract talks with Big Three . . . Shorter week without pay loss expected to be major issue . . . Union's argument to turn on increasing automation—By *T. L. Carry.*

◆ PRESENT UAW contracts with the Big Three auto producers do not terminate until 1958 but already the union is laying groundwork for new and bigger demands to be made at the next major bargaining session.

At a meeting in Detroit of the UAW's General Motors Council, a resolution for a shorter workweek was passed. The council, which consists of 119 bargaining units within GM, also voted unanimously to make the shorter week one of the major demands in 1958.

What it boils down to is that Walter Reuther, UAW president, wants the workweek reduced without the workers sacrificing their regular 40 hr pay.

Mr. Reuther did not say specifically how much he wants the week shortened, but it is generally conceded that he is aiming at a 30 hr week.

Nobody knows at this point if Mr. Reuther is truly serious about his proposal. It is possible that the idea is being passed around to take the workers' minds off the shortness, both in time and money, of the SUB payments that will start next week.

Union Rivalry . . . Another possible reason could be the rivalry that exists between Mr. Reuther and Carl Stellato, president of the huge Ford Local 600.

The Ford union leader went along reluctantly with Mr. Reuther's SUB plan last year. Also, Mr. Stellato insisted up until the very last minute that the contract with Ford be drawn for only 1 year.

It is well known that Mr. Stellato agreed to SUB and a 3-year contract only because he was promised that in 1958 the shorter workweek would be one of the union's major demands.

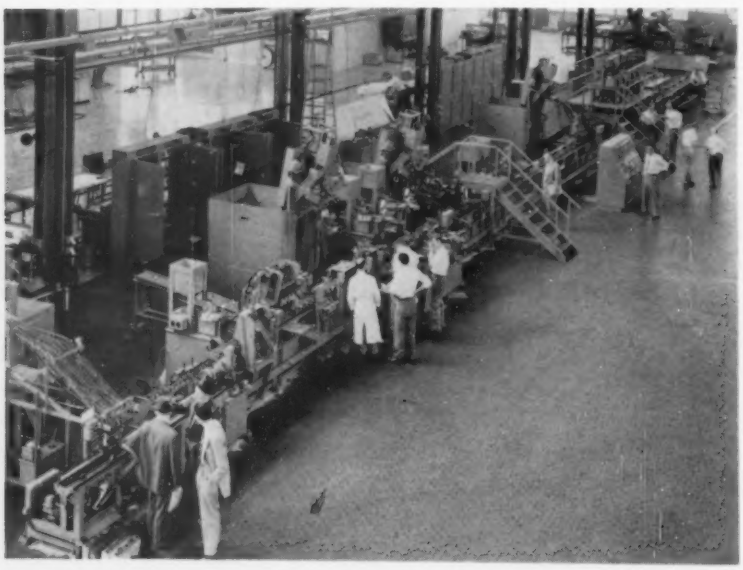
At the same time, the shorter week fits neatly into the pattern which must be followed for a union leader to maintain his position. It gives the membership the impression that its leaders are constantly seeking bigger and better concessions from management.

Placed on a practical basis, the man whose gross pay is $90 a week for 40 hrs would be getting the equivalent of a 75¢ an hr raise if his workweek were reduced to 30 hr and he got the same amount of pay.

Thanks to Automation . . . So, like any other gains that labor has made in the past, when the shorter workweek is granted it will come in small, gradual doses. Just as the present SUB plan has started on a small scale, any move in the direction of a shorter week is likely to do the same.

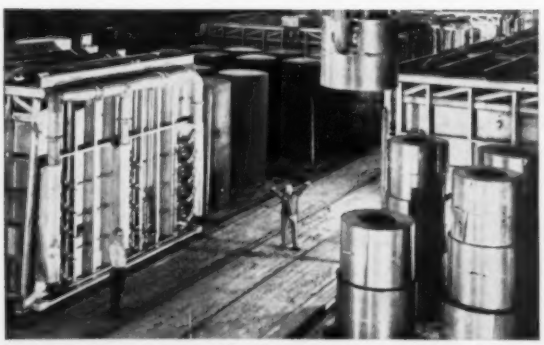
As the campaign increases in tempo, automation will come in for a bigger and bigger share of criticism.

A survey by the American Society of Tool Engineers shows that the automobile industry is not only leading in the use of automated equipment but is increasing its

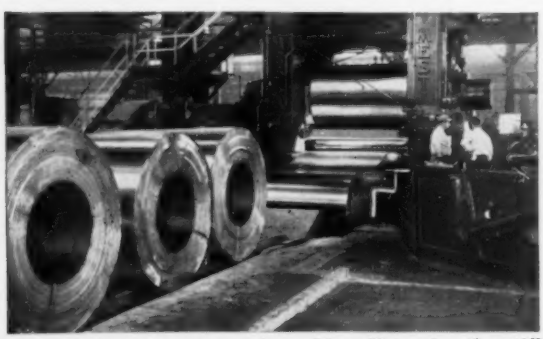


NEW MACHINE for assembling cylinder heads undergoes final inspection at General Motors Technical Center prior to installation at Oldsmobile Div. It assembles 75 parts into the completed head for "Rocket" engines.

How Great Lakes Steel *puts the pressure* on quality



COILS ARE ANNEALED in these giant ovens to impart maximum softness and ductility. And then . . .



COILS ARE TEMPER ROLLED in a skin mill to give the stiffness, surface and flatness which have been specified by the customer for the order.

Right on the nose—not too hard, not too soft! This steel coil passes the Rockwell Test with tolerance to spare.

In the Rockwell, or hardness test, pressure is put on a sample piece of coil by a system of loads applied through a tiny ball. A needle gauge signals the depth of the impression. From this, our test engineers can readily tell: (1) if the coil was annealed to maximum softness for extra-deep drawing; and (2) if it is now properly tempered to meet customer specifications.

Quality control every step of the way—yes, that's our most important job at Great Lakes. Reason enough to call us and talk over your steel needs?

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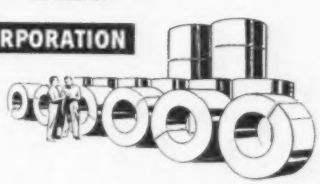

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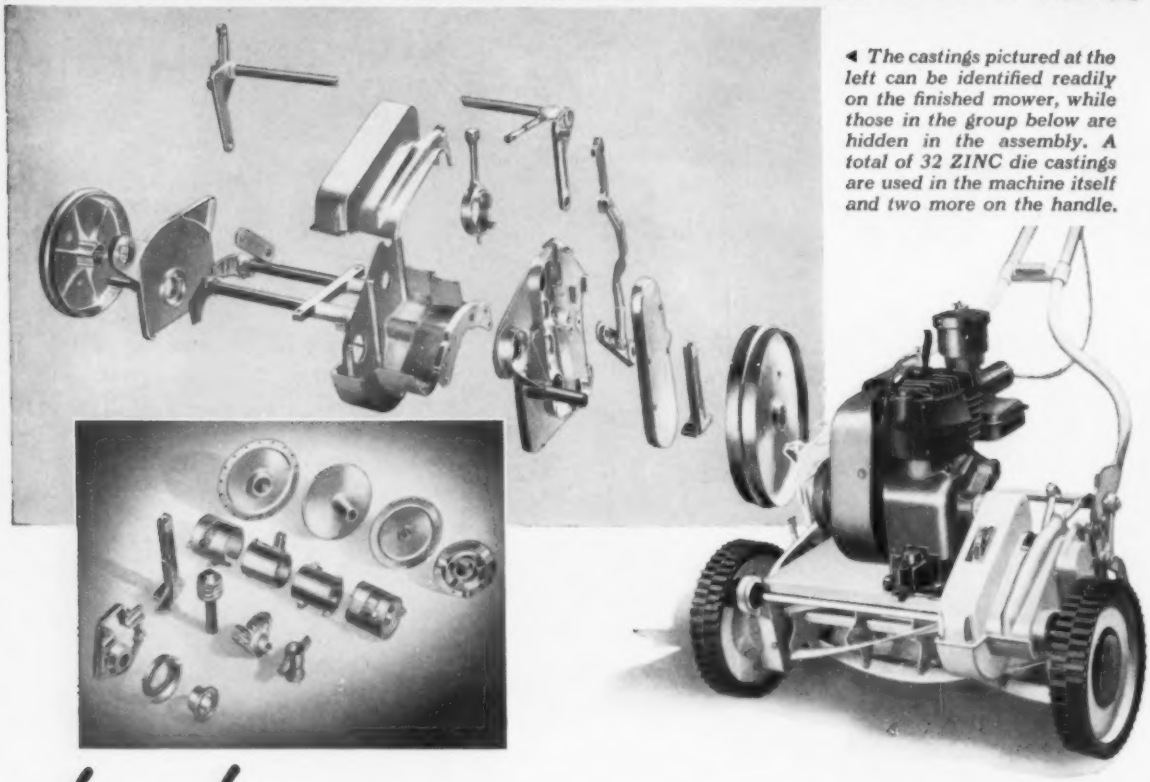
WHY ZINC RATES FIRST IN DIE CASTING • NUMBER 2 OF A SERIES



◀ *The castings pictured at the left can be identified readily on the finished mower, while those in the group below are hidden in the assembly. A total of 32 ZINC die castings are used in the machine itself and two more on the handle.*

toughness – as proved by CLEMSON

In designing the new reel-type "Power Drive" mower, Clemson Bros., Inc. has employed ZINC die cast components wherever possible—with full assurance of their durability. Behind this decision lies over 15 years of outstanding performance of ZINC die castings in Clemson's well-known hand mower. And the use of this metal and method of production not only insures efficient, dependable service, but provides smooth surfaces for a finished appearance that could not be matched at comparable cost by any other means of manufacture.

The impact strength of ZINC die castings exceeds that of the other commonly used die casting alloys. And this ability to withstand sudden shock is only one of the strength characteristics which account for the preference for ZINC. Outstanding in tensile and compressive strength, as well as in ductility and hardness, ZINC die castings get the call where *toughness* is an important consideration.

High strength is just one of the many reasons why ZINC rates first in die casting. We suggest that you watch these pages in the months ahead for other examples of ZINC die casting advantages in product design. In the meantime, send for our new brochure and contact any commercial die caster for assistance in solving your particular production problems.

Send for your copy

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Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
JUNE 2, 1956	87,607	19,727
MAY 26, 1956	114,871	23,841
JUNE 4, 1955	135,990	27,741
MAY 28, 1955	174,517	32,039

*Estimated. Source: *Ward's Reports*

lead. ASTE says that more than one-third of the industry's combined purchases for new equipment in 1956-57 will be automated.

And Mr. Reuther has stated on numerous occasions that the use of more productive tools makes shorter workweeks possible.

How much of this the Big Three are likely to buy remains to be seen.

Sales Ups and Downs

The automobile sales picture is not completely black. Three makes, Lincoln, Nash and Rambler, have been steadily increasing their market penetration.

Lincoln sales for the second 10 days of May totaled 1216 units and marked the 23rd consecutive period in which sales have improved over corresponding periods last year.

Total sales of Lincolns so far this year have reached 17,320 units, an increase of 29 pct over 1955.

Nash sales for the period were 37.7 pct better than the first 10 days in May. Altogether, the division sold 3787 cars, which is 35.3 pct better than the same period in April of this year.

Rambler retail deliveries for the 10-day period ending May 20 climbed 23.5 pct over the like period in April and 26.1 pct over the first 10 days in May.

Meanwhile, lack of 10-day reports from other producers serves as an excellent indication of the general condition of the automobile market.

The industry continues to cut production and, according to Ward's Reports, hopes to reduce the number of new car stocks by at least 100,000 units by June 30.

Daily production of cars for June is tentatively set at about 21,250 units. But nobody knows just how many days in the month the industry will work. That depends on how good sales are.

Harlow Curtice, president of General Motors, says the abnormally high new car inventories this year are mainly due to the fact that GM's competitors introduced their 1956 models too early last fall and produced too heavily before the first of the year.

GM's inventories, Mr. Curtice says, were in line with the market until the sales decline began to affect the corporation around April 1.

SUB Pay Is Tax Free

Payments to laid-off employees under supplementary unemployment benefit (SUB) plans are not wages and therefore are not subject to the federal withholding tax, Internal Revenue Service says in a new ruling.

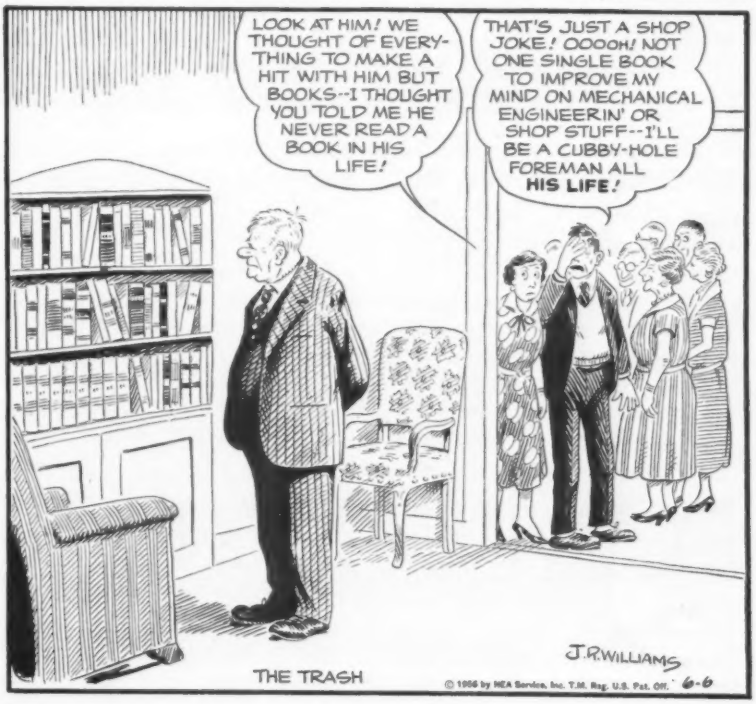
Decision on this point comes as General Motors, Ford, and Chrysler begin contributing SUB payments to idle workers under agreements made between management and labor in 1955. It is an important decision for recipients of federal-state unemployment compensation, because the states could have ordered that workers were not eligible for both wages and compensation.

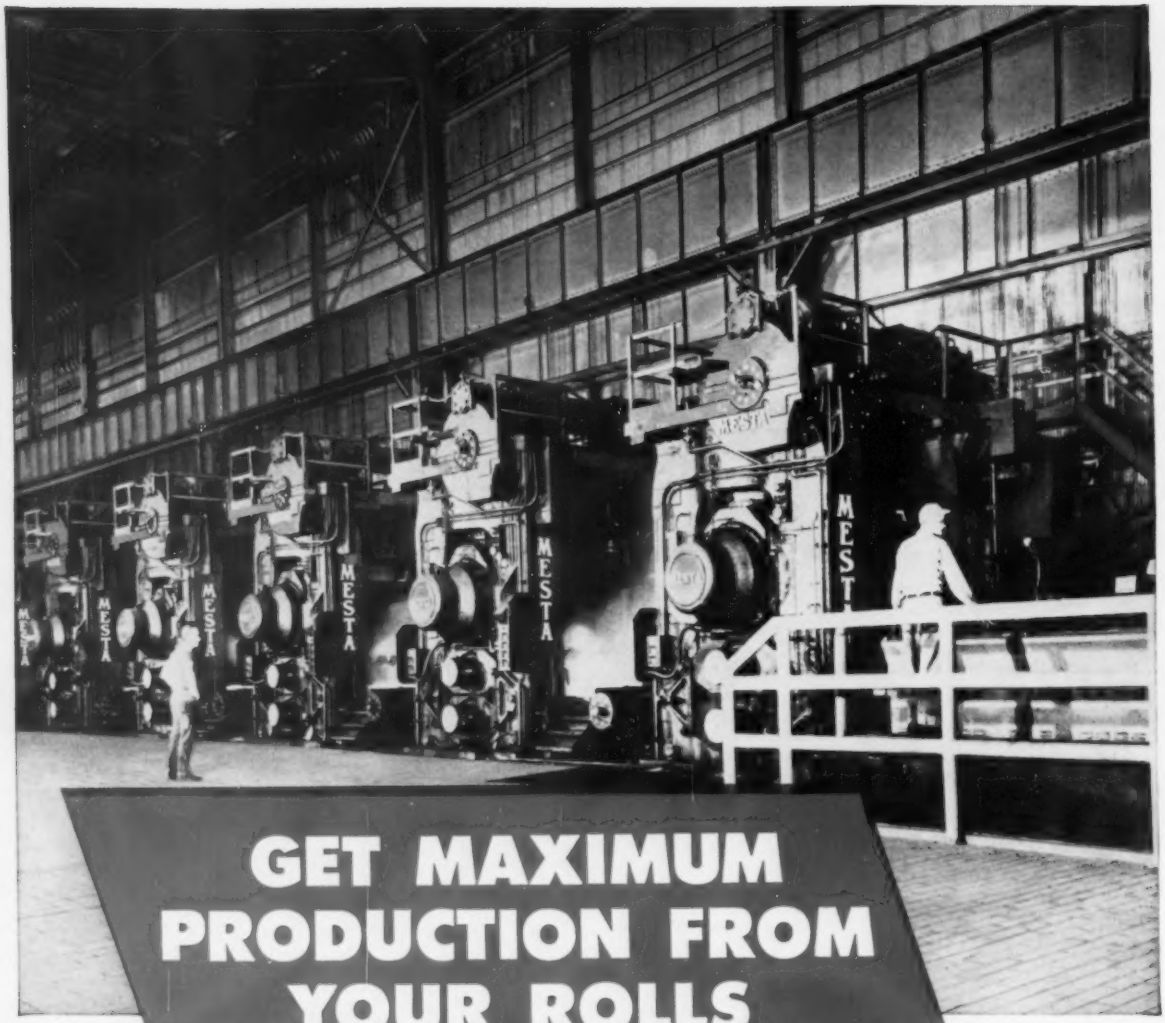
In reporting their income for the year, however, those who get SUB funds will have to report this money as part of the total. SUB payments will be taxed as if they were dividends or some other non-wage income.

Ultimately, the tax on this year's benefits probably will not create much revenue. Only about 30,000 auto workers were expected to be in line for SUB payments at the start of June. Programs have not been in effect long enough to provide funds that will carry through 26 weeks of unemployment.

Federal - state unemployment benefits, plus SUB payments, are intended to reach 65 pct of a worker's normal take-home pay during the first four weeks he is idle. In the next 22 weeks, the combined funds are to be 60 pct.

THE BULL OF THE WOODS — **By J. R. Williams**





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More Than $100 Million a Day on Defense?

Congress feels that defense must be strengthened . . . But higher costs of most materials will boost budget requirements more . . . Financial debate starts next week . . . Civil Defense lethargy hit—*By G. H. Baker.*

◆ HIGH COST of national defense (now running at the rate of nearly $100,000,000 per day) is to climb still higher in the new fiscal year starting July 1. There are two basic reasons for the coming rise in military costs:

1. Among congressmen, there is a growing belief among members of both political parties that the United States must accelerate its production of military hardware if it is to maintain military superiority over the Reds.

2. Rising costs of steel, copper, and aluminum are forcing defense contractors and subcontractors to mark up the price tags on many items sold to the government.

$1 Billion More . . . Combine these two reasons and you can see why many congressmen are saying that we've got to increase our defense budget by at least $1 billion a year extra just to hold our present position. Putting it another way: The advent of new and more expensive weapons, plus creeping inflation, means that the Defense Dept. has to run faster and spend more just to "break even."

During the second week of June, the Senate will take up the debate and passage of the overall military money bill for fiscal 1957. As approved by the House, the bill provides just over $33.8 billion. Judging by some strong hints being dropped by key members of the Senate Appropriations Committee, there is every likelihood that the final version of the bill will carry at least $35 billion for the Army, Navy, and Air Force during the next 12 months, and possibly as much as $36 billion.

No matter what the final outcome, the Air Force will receive the biggest share (nearly half) of the total kitty. President Eisenhower has asked for $15.6 billion for the Air Force. It looks like this sum may be beefed up by at least $1 billion, while the new spending money for the Army will remain at about $7.5 billion and the Navy at about $10 billion.

Prod Civil Defense . . . Top civil defense planners are blasting away at the smug popular notion that an atomic bombing of U. S. cities will mean no more inconvenience than a drive into the country.

Too many citizens have the vague notion that U. S. business and industry will go on as usual in areas subjected to bombing. It evidently has not occurred to a lot of people that food and water supplies will be totally ruined.

Grim Prospect . . . Here's the grim outlook given Congress by Val Peterson, civil defense boss:

"This talk about paying people, clothing people, and feeding people at a time of nuclear attack is

Place Your Bets on the U. S. Birth Rate

You can get a good idea of how consumer demand is growing by leaps and bounds by a glance at these new population totals compiled by the U. S. Census Bureau:

▪ Total U. S. population is now about 167,500,000. This means the total number of persons living in the U. S. is now 10 pct higher than in 1950.

▪ About 23,500,000 babies have been born in the past five years. This figure is almost as many as the total number born in the 10-year period 1930-1940.

In 1955 alone, there were 4,091,000 births — an all time high.

▪ Ninety pct of the gain in the past six years is due to the sharp rise in the birth rate. The remaining 10 pct of the gain is due to immigration.

▪ In each of the past five years, the number of births exceeded 3,800,000. Compare this with 1940, in which there were only 2,600,000 births. Yet 1940 was considered a "fertile" year, by standards of the 1930's.

▪ Today's high rate of fertility shows every indication of holding firm for an indefinite period. All of which points to the need for continued growth of both factory production and distribution patterns.

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academic. . . . If you kill 10 to 25 million Americans, and injure another 10 to 25 million Americans, I don't think we will use money . . . The best we can do is to run soup kitchens . . . If this kind of war occurs, life is going to be stark . . . elemental . . . brutal . . . filthy . . . miserable . . . This country is going to go through hell . . . and the world is going to be thrown into such convulsions as it has never known before . . . our food will consist of gruel from wheat . . . animals that we can slaughter before they become radioactive . . . we'll sleep anywhere we can . . . wear any type of clothing obtainable . . . our fortune now is our huge stockpiles of surplus food, but these may become radioactive."

(Peterson unveiled this off-the-cuff picture after he learned that Congress declines to participate in the national civil defense exercises scheduled for mid-July.)

Tax Stock Profits

Employees who are allowed to buy company stock at reduced prices must pay federal income taxes on the gains over the market price, the U. S. Supreme Court rules.

Earlier court decisions have held that stock gains are taxable if the grant of stock option is intended as added compensation, and that gains are not taxable if the intent of management in such cases is to provide employees with a proprietary interest in the company.

Either way, the income tax on the gains applies, the Supreme Court says, holding that it makes no difference as to why the stock was offered.

Higher Postal Rates?

Legislation to increase postage on all classes of mail by about 30 pct—thus hiking the costs of billing and advertising — is being pushed in Congress, but prospects are that final action will be delayed at least until next year.

The House Post Office Committee has approved a bill to increase the rate for first class mail (bills and letters) from 3 to 4 cents; the rate for third class catalogs and advertising matter by 30 pct, and bulk mail by about 2 cents a lb.

The proposed increases would bring in about $432 million a year to the government, paid mostly by business, which is the largest mail user. The Eisenhower Administration is backing the proposed increase.

There is enough opposition to the postal increase to block its approval in an election year. Boosters of the increase admit privately they are mainly laying groundwork for next year when they expect passage without too much difficulty.

Prices:

New bill aimed at price cutting.

A bill to limit the so-called "good faith" defense in price discrimination cases stands a fair chance of being approved.

WASHINGTON NEWS

The bill (H. R. 11) sponsored by Rep. Wright Patman, D., Tex., and Sen. John Sparkman, D., Ala., would overrule a Supreme Court decision which the bill's sponsors claim has made it virtually impossible for the Federal Trade Commission to enforce the Robinson-Patman Act.

Tighten Loophole

In that decision—which the bill attempts to "correct" — the Supreme Court ruled that a manufacturer, jobber, or warehouser may cut its prices below a fair level if it is done in good faith to meet competition.

The bill's sponsors say that this "loophole" should be severely restricted in order to protect small businessmen from predatory price practices of their larger competitors. The Supreme Court ruling, they add, permits large firms to engage in price wars with resulting damage to small businessmen.

Help Asked for Tungsten Producers

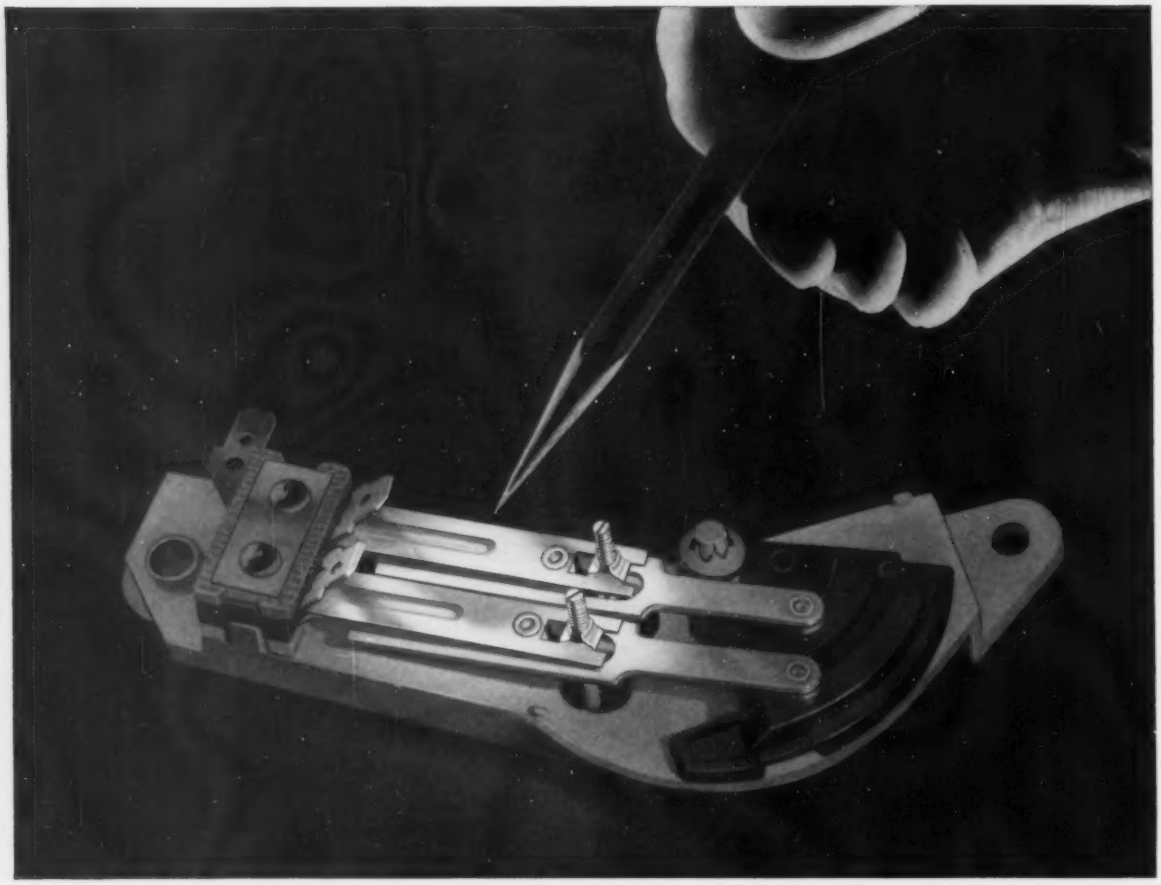
◆ DOMESTIC tungsten producers find both the Congress and the Eisenhower Administration ready to open up the money belt to continue buying their product, with Congress apparently willing to dig a little more deeply into the funds.

Administration support for keeping the tungsten purchase program going, though at a reduced rate and with a fixed cut-off date, is voiced by Felix Wormser, Assistant Secretary, U. S. Interior Dept. He would extend the present buying operation into 1958.

Both tungsten and asbestos producers need government procurement guarantees to put them in sufficiently sound shape to meet future marketing conditions, says Mr. Wormser. But he opposes prolonging such aid for supplies of mica, manganese, beryl, chrome, and columbium-tantalite.

During the extended period for tungsten buying, he suggests, government would contract for one million units, each unit weighing 20 lb. This would mean a reduction in the present rate of tungsten accumulation. Price would be $52.50 per unit, compared with present federal price of $63.

The subcommittee, however, to prevent damage to less efficient producers, is considering a unit price of $55 and a total purchase of 1.25 million units. Most members favor extending the program until the close of 1958 and may recommend a bonus, or subsidy, for smaller tungsten firms.



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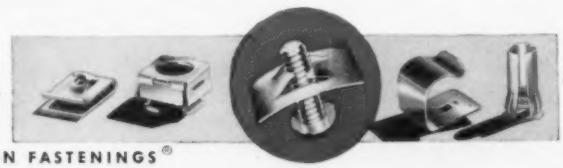
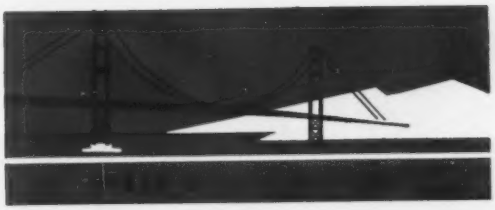




New Techniques in Aircraft Machining

Chemical milling gains prestige . . . Precision etching process is successful in aircraft industry . . . Equipment costs are low and facilities easy to set up . . . West expansion—By R. R. Kay.

◆ MACHINING COSTS too high? Are you finding it too expensive to remove metal from forged or formed parts? Looking for new ways to cut weight without strength loss? New design freedom?

If these problems haunt you why not look into chemical milling—a precision etching process. It's highly successful in the aircraft industry where low weight-high strength parts are a must. Today, high quality chemically milled aluminum aircraft parts are on a production basis at some 30 aircraft and missile companies.

Transporters Like It . . . Steel, titanium, and magnesium—more difficult to machine than aluminum—are now getting into the act. The developers see the transportation industry as the biggest potential user, because some automobile, truck, bus, train, and ship parts can be designed for less weight without machining. This means more efficient use of the fuel and less wear and tear on propulsion machinery. Example: A destroyer's aluminum mast, tapered by chemical milling, will have the same strength with one-third less weight.

"Engineers aren't limited any more in their design ideas to what they can do by the usual machining methods. This process saves a lot of time since we can etch many parts simultaneously. The only restriction is the size of the tanks containing the chemical solution." So says chemical milling's inventor, Manuel C. Sanz, Missile Development Div. of North American Aviation, Inc.

Some suggested uses: (1) reducing diameters of spheres, such as ball bearings; (2) architectural design work; (3) burst pressure gages (diaphragms can be milled to .002 in.—thin enough to blow smoke through—and with a uniform, undistorted surface); (4) camera shutters.

Simple and Inexpensive . . . Turco Products, Inc., Los Angeles, North American Aviation's licensee, says Chem-Mill is extremely simple to work. Equipment costs are low. Facilities are easy and fast to set up. Based on its experience with aluminum, Turco now has an operating pilot plant for chemical milling of steel, titanium, and magnesium.

Developers claim: (1) You have accurate control of milled depths. (2) The process works on already contoured parts. (3) You can mass produce by this technique. (4) You can use a great variety of patterns.

Construction Advances

Heavy construction work, the kind that has a massive appetite for huge amounts of steel, is up more than 40 pct in the 11 Western States for the first five months of 1956.

Leading the parade of large engineering projects are: bridge building, dam construction, railroad projects, machinery.

Grand total of contract awards: $1.75 billion for first five months of 1956 vs less than $1.25 billion same period 1955.

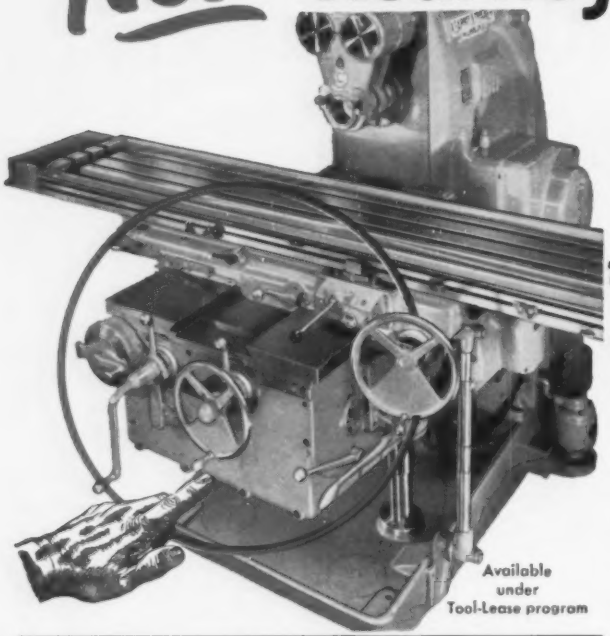
Floating Winery

Easterners can look for California wines to come their way by the boatload. A $6 million wine tanker, probably this country's first, will be built in the San Francisco Bay Area yards of Bethlehem Pacific Coast Steel Corp. The 550-ft vessel will use stainless steel wine tanks, pumps, and pipes.

Spreading Good Cheer

Aircraft industry subcontracting sure spreads the work around. Here's a good current example: Lockheed Aircraft Corp is putting some 40 pct of its F-104A jet fighter manufacture into these hands: Beech Aircraft Corp., Wichita, Kan., aft fuselage; Goodyear Aircraft Corp., Arizona Div., Litchfield Park, Ariz., nose section; Rheem Manufacturing Co., Downey, Calif., entire tail assembly; and Temco Aircraft Corp., Dallas, Texas, complete wing.

New Kearney & Trecker's "Bull's-Eye" Control Grouping



Available under Tool-Lease program

TF Series milling machine's controls are conveniently grouped up-front where they belong to assure accurate settings ...measurably reduce operator fatigue

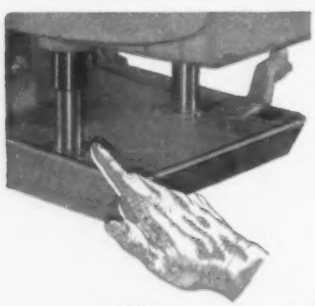
ONE look tells why the new TF Series milling machines — Plain, Universal and Vertical — are so easy to operate. "Bull's-eye" up-front control grouping permits operators to achieve exact settings faster, more adeptly and with greater ease than ever before. This "Fron-Trol" convenience is the key to low-cost production . . . because it increases the operator's efficiency and measurably reduces fatigue through elimination of wasted steps.

The "bull's-eye" knee and saddle-mounted controls are safety-interlocked and include feed selection, directional Mono-Lever table feed and rapid traverse, automatic cycle table feed and rapid traverse controls, front-mounted table handwheel, saddle clamping gib and backlash eliminator and hand and power directional controls for knee and saddle movements.

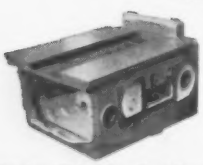
In addition, the new TF's give you a superior combination of outstanding design and operating features never before available on any other knee-type milling machines. They're built in five sizes — No. 2 to No. 6 from 10hp to 50hp.

Why take less than the latest when you want new milling machines? You can get all the facts on new TF Series machines from your Kearney & Trecker representative — call him or mail coupon direct to factory today.

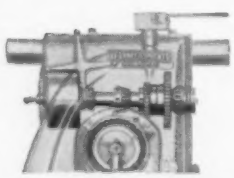
A few of many reasons why TF Series milling machines are so easy to operate



Twin Screw Knee Support — Exclusive double-support arrangement most effectively distributes weight of new machines' much wider, heavier knee, saddle and table. Balanced design substantially increases stability under heaviest loads . . offers greater resistance to torsional thrust under all cuts . . halves the wear factor, assuring greater, longer-lasting accuracy.



Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life . . . excellent finish . . . quieter and vibrationless operation.

Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.

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Buck-Passing Aids Tooling Progress

Builders hand stick to engineers at hydraulics forum . . . Design improvement almost certain for heat and vibration control . . . Other problems involve speed and feed coordination—*By E. J. Egan, Jr.*

◆ A SURPRISING amount of machine tool progress stems from the supposedly unsportsmanlike act of "passing the buck." Customers pass it to builders, and builders in turn hand it on to vendors of the many special components that go into modern machine tools.

All in the name of progress, builders politely passed several "bucks" to hydraulics engineers recently. Occasion was the Second Production Machine Tool Hydraulic Forum, sponsored by Vickers, Inc., and held in Detroit. Its purpose: a thorough airing of hydraulic problems confronting metalworking equipment builders.

A major spokesman for the builders was Louis Polk, president of The Sheffield Corp., Dayton, Ohio, and currently serving as president of the National Machine Tool Builders Assn. In a featured address before the Forum, he ticked off a list of hydraulic "wants" that builders have compiled.

Heat Control . . . Seeking helpful ways to keep machine tools from heating up, Mr. Polk said, "Heat in hydraulic lines, pumps and valves is particularly critical because, like heat from any other source, it can impair accuracy."

He points out that a heated piston tends to change the rate of feed, whereas uniform feed is essential. This is especially true "for automatic operations where certain coordinating and dovetailing movements must be perfectly timed with each other."

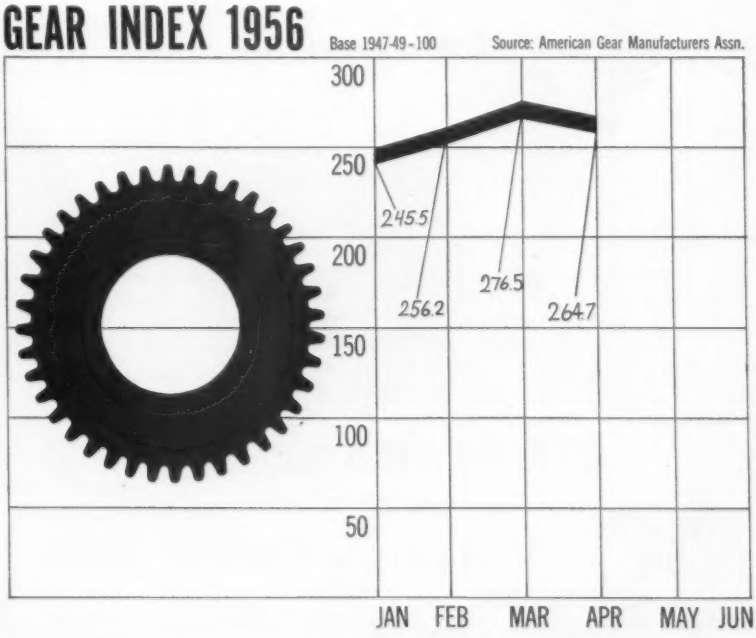
The speaker also outlined a need for increasing the strength and durability of hydraulic components as higher pressures are utilized. He mentioned that the aircraft industry successfully operates small, lightweight valves and piping in the 3000-psi area, and is giving serious attention to pressures of 5000 psi.

Advantages of these higher pressures are that they actually seem to reduce friction loss. This means more horsepower transmitted with less heat, a goal builders strive for continuously.

Feed and Vibration . . . Mr. Polk said machine tool engineers would find it helpful to be able to use components whose orifices would permit feeding through in either direction. They would also "welcome improved control of viscosity." Builders and customers alike would approve of standardized valve mountings for better interchangeability, he commented.

Another respectful request was for a more vibration-free pump that would deliver a smoother flow of hydraulic power. In line with power requirements, the speaker said that more and more will be needed to take full advantage of new cutting tool materials. In addition, speed and feed controls will have to be more sensitive.

Mr. Polk suggested that, "perhaps a fluid motor can be integral with the machine spindle to reduce vibration and noise further, and control speed more accurately."



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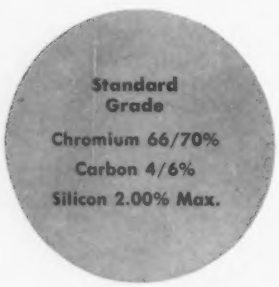

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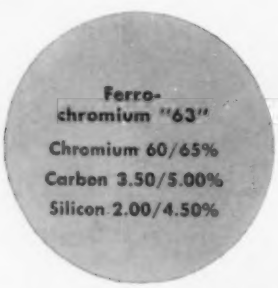

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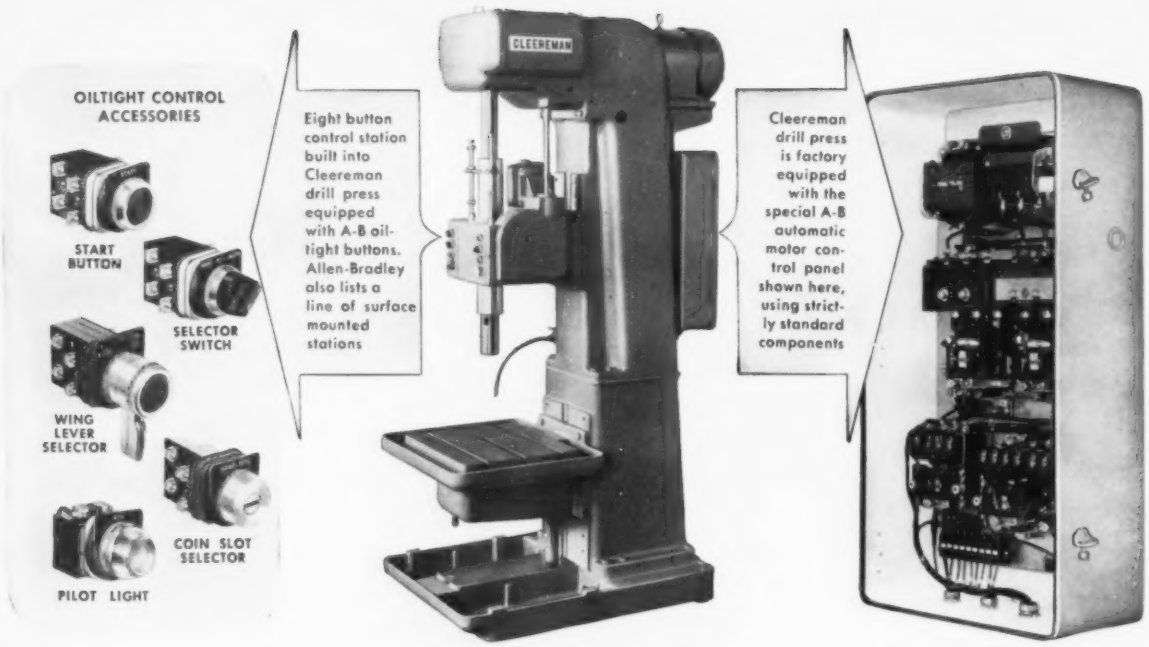

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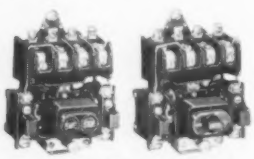

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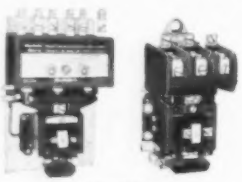

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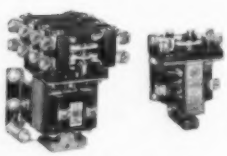

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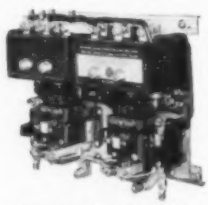

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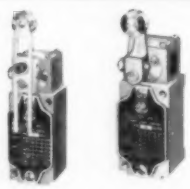

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The Iron Age SALUTES

Walter H. Holcroft

Vice president of Holcroft & Co., his reputation for treating people kindly is as well appreciated as his knowledge of heat treating metals. Many new processes are credited to his inventive genius.

For a man who is one of the nation's leading experts on heat treating, Walter H. Holcroft has an exceptionally cool temperament. For a lifetime he has watched metals react under temperature while he calmly calculated better ways of annealing and case hardening them. His affable, easy-going personality has won him many friends in the steel industry and among his associates at Holcroft & Co. of Detroit, where he is vice president.

Mr. Holcroft's placid manner, however, conceals an inner drive that has pushed him to the forefront as an inventor and manufacturer of industrial furnaces. He has numerous patents and technical papers to his credit.

A native of Chester, Pa., Mr. Holcroft has lived most of his adult life in the Detroit area. His education was aimed directly at a career in the iron and steel industry. During summer vacations from the University of Michigan, where he studied chemical engineering, he worked at his uncle's furnace factory—the same firm of which he is now vice president.

To his credit are inventions such as the short-cycle malleable annealing process, gas carburizing furnaces, processes for hardening war material, normalizing of steels and numerous others. His endeavors have led him into active membership in several engineering societies and to the vice presidency of the Industrial Heating Equipment Assn.

At this point it might be suspected that Mr. Holcroft is one of those fortunate persons whose work provides him with recreation, too. That's the way it is. But he also gets a lot of pleasure out of playing handball, and reportedly is quite a formidable opponent in that sport. But whether he is working up a sweat on the handball court or at the business end of an annealing furnace, you can be certain that Walter Holcroft's thoughts are cool and collected. It's a big factor in his success story.

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The Iron Age INTRODUCES

GEORGE B. SCHIERBERG, elected president and treasurer, Granite City Steel Co., Granite City, Ill.

W. Kenneth Daly, elected vice president and comptroller, **The Anaconda Co.,** N. Y.

Jack R. DeBacher, elected vice president, **Thor Power Tool Co.,** Aurora, Ill.

W. F. Lent, elected vice president, manufacturing, **Cutler-Hammer Inc.,** Milwaukee; **R. A. Millermaster,** elected vice president, development.

Richard M. Quimby, elected secretary and treasurer, **The Beryllium Corp.,** Reading, Pa.; **Robert M. Whitaker,** elected ass't treasurer and ass't secretary.

John R. Titlow, elected director and vice president, **Lamson Mobilift Corp.,** Portland, Ore.

Howard J. Bowman, appointed director, research and development, **Trent Tube Co.,** East Troy, Wis.

William F. Johnson, named director, sales, **Consolidated Electrodynamics Corp.,** Pasadena, Calif.

Chester C. Lonsdale, named assistant to superintendent, Pressed Steel Div., **Standard Pressed Steel Co.,** Jenkintown, Pa.

Paul A. Waalkes, named assistant manager, compound sales, **Hanson-Van Winkle-Munning Co.,** Matawan, N. J.

Jack F. Major, named superintendent, Campbell Coke plant, **The Youngstown Sheet and Tube Co.,** Youngstown, O.; **Richard P. Collins,** named superintendent, transportation and labor, Brier Hill Works; **Harold Fahnestock,** named assistant superintendent, Masonry Dept., Youngstown district.

Clare L. Beattie, appointed supervisor, instrumentation component, Electro-mechanical Engineering Unit, Large Steam Turbine-Generator Dept., Materials and Processes Lab., **General Electric Co.,** Schenectady, N. Y.

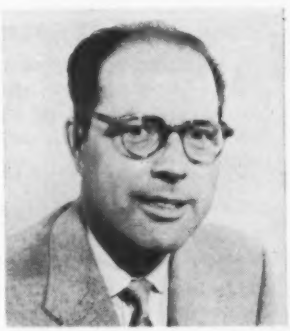
A. A. Lodigensky, named managing director, exports, **H. K. Porter Co., Inc.,** New York.

Following appointments are within the Steel and Tubes Div., **Republic Steel Corp.: Herbert J. Meyfarth,** appointed assistant division manager, Cleveland; **Charles H. Johnson,** named superintendent, Elyria plant; **Frank A. Royce,** named superintendent, Cleveland plant; **Clayton W. Wright,** named assistant superintendent, Cleveland plant; **Lynn L. Brainard,** appointed assistant superintendent, Brooklyn.

J. D. Holtzapple, appointed director, safety, **Blaw-Knox Co.,** Pittsburgh.

S. Eugene Hubbard, appointed manager, prefabrication research, **Kawneer Co.,** Niles, Mich.

CLYDE E. WEED, elected president, The Anaconda Co., Chile Copper Co., Chile Exploration Co., and Andes Copper Mining Co.



WALTER R. LOWRY, elected president, The Beryllium Corp., Reading, Pa.

PAUL C. ZIEGLER, named manager, Steel and Tubes Div., Republic Steel Corp., Cleveland.

G. W. Bowman, named sales manager, Hoist Div., **Harnischfeger Corp.,** Cleveland; **F. A. Liebich,** named district manager, Industrial Div.

Charles J. Smith, named manager, manufacturing, Plastics Div. **Bryant Electric Co.,** subsidiary of Westinghouse Electric Corp.; **Jack K. Adams,** named manager, manufacturing, wiring device, Appliance Controls Div.

Neil E. Firestone, named manager, manufacturing operations service, **General Electric Co.,** Schenectady, N. Y.; **John S. Macdonald,** named general manager, Distribution Assemblies Dept., Plainville, Conn.; **Armand V. Feigenbaum,** named manager, quality control service.

Edward J. Carroll, named assistant sales manager, **Kennametal Inc.,** Bedford, Pa.

Archie D. Whitlow, named steel co-ordinator, **Delta Tank Manufacturing Co., Inc.,** Baton Rouge, La.

John J. Anderson, named manager, Major Appliance Div., **Westinghouse Electric Corp.,** Mansfield, O.; **S. J. Stephenson,** named manager, Portable Appliance Div.

D. S. McCleary, named assistant director, purchases, **Blaw-Knox Co.,** Pittsburgh; **Wayne Rawley, H. P. Bork, B. R. Lauer,** promoted to staff purchasing agents.

Charles A. Gomer, appointed district sales manager, Baltimore, **Inland Steel Products Co.,** Milwaukee.

James D. Cannon, named manager, production sales, Detroit Universal Div., **Chrysler Corp.,** Detroit.

Joseph A. Bell, appointed district sales representative, Leschen Wire Rope Div., Quaker Rubber, and Henry Disston Div., **H. K. Porter Co., Inc.,** N. Y.

N. P. VEEDER, elected executive vice president, Granite City Steel Co., Granite City, Ill.

THOMAS A. CAMPBELL, elected vice president, The Anaconda Co., New York.

JAMES L. HAMILTON, JR., elected vice president and general manager, sales, Granite City Steel Co., Granite City, Ill.

GORDON W. SMITHSON, elected vice president and chief engineer, Potter & Johnston Co., subsidiary of Pratt & Whitney Co., Inc., W. Hartford, Conn.

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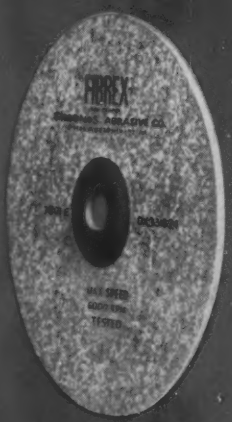

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PERSONNEL

Harry B. Wheeler, named credit manager, **Warner & Swasey Co.,** Cleveland.

Leo S. Ohman, appointed plant manager, Mechanical Div., **General Mills, Inc.,** Minneapolis.

Arthur E. Franks, appointed manager, operations, **Vacuum Metals Corp.,** Pittsburgh; **Christopher S. Houghton,** named superintendent, melting.

John L. Peterson, joined the sales force, Pittsburgh regional office, **Electro Metallurgical Co.,** Division of Union Carbide and Carbon Corp., N. Y.

Richard E. McGinnis, named manager, field sales, and **John S. Godley,** named marketing manager, Nelson Stud Welding Div., **Gregory Industries, Inc.,** Lorain, O.

Frederick H. Ruff, Jr., named physical chemist, Research Lab., **Allegheny Ludlum Steel Corp.,** Brackenridge, Pa.; **Ann V. Carney,** named research chemist; **Merlin L. Osborn,** named research physicist.

Theodore A. Day and **Henry P. Krogstad,** named sales representatives, Stanley Steel Strapping, Division of **The Stanley Works,** New Britain, Conn.

John Douglas, appointed Detroit district representative, **Jomac, Inc.,** Philadelphia.

Audenried Whittemore, Jr., appointed sales engineer, Industrial Glass Sales Dept., **Pittsburgh Plate Glass Co.,** Pittsburgh.

OBITUARIES

Roy J. Martin, superintendent, industrial relations, Newburgh Works, American Steel & Wire Div., **U. S. Steel Corp.**

Claude M. Nelles, president, **United Steel Supply Co.,** Detroit.

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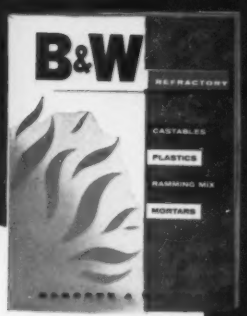

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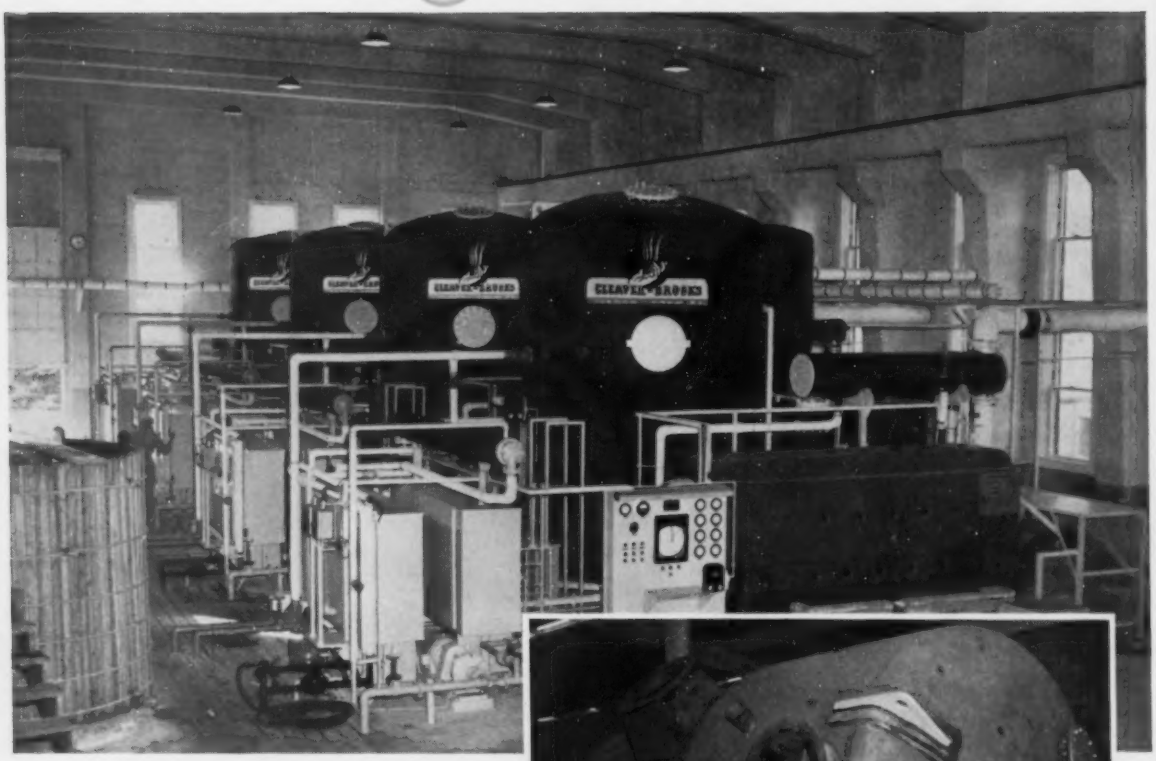
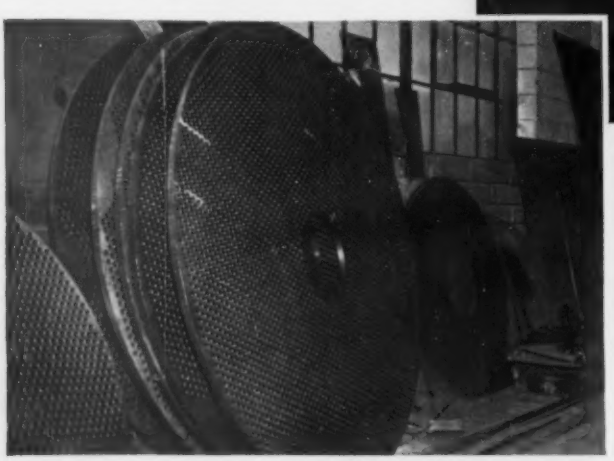
World's



BATTERY OF CLEAVER-BROOKS EVAPORATORS IN ACTION—Revere Silicon Bronze was chosen for these evaporators and their component parts because of its high corrosion resistance and non-contamination properties, great strength and weldability. All of the components, as well as the 4 evaporator shells, are made of Revere Silicon Bronze Alloy No. 420.

ONE OF THE 4 EVAPORATOR SHELLS made of Revere Silicon Bronze, fabricated and installed by CLEAVER-BROOKS MFG. CORP., Waukesha, Wisconsin.



EIGHT TUBE SHEETS LIKE THESE were used in the Bermuda installation . . . 2 per evaporator. Each tube sheet, made of Revere Silicon Bronze, is 86" in diameter, 1¼" thick and weighed approximately 1,360 lbs. after drilling.

Largest

VAPOR-COMPRESSION SEA WATER DISTILLATION PLANT

Made and installed by CLEAVER-BROOKS

. . . Vital distillation units fabricated from REVERE SILICON BRONZE

This plant installed at the Kindley Air Force Base in Bermuda has a total daily capacity of 200,000 gallons and eliminates the dependence of the Base on rainfall or shipment of water by tankers.

Distilled water is produced in the ratio of 300 lbs. to each pound of Diesel fuel. Total costs are estimated at $1.25 per thousand gallons of distilled water. Nearly every component part made by Cleaver-Brooks is about twice the size of its largest previous counterpart. For example, the evaporators are 16½ feet high. Each, with its component parts, weighs approximately 40,000 lbs., the empty Revere Silicon Bronze shell alone accounting for 28,000 lbs.

There is an interesting story behind the development and manufacture of this equipment. The four huge pressure vessels had to be fabricated of Revere Silicon Bronze Alloy No. 420. Knowing Revere's wide experience in welding copper-base alloys, Cleaver-Brooks called in a Technical Advisor, and gave him a complete set of blueprints of the vessels, with a request for suggestions regarding joint design and welding techniques. He in turn consulted the Welding Section of the Revere Research Department. Their recommendations were adopted, and the customer reported that the original estimate of welding time had been cut considerably, reducing production costs correspondingly.

The Revere Technical Advisory Service is glad to collaborate on problems involving the specification and fabrication of copper and copper-base alloys, and aluminum alloys. See the nearest Revere Sales Office.

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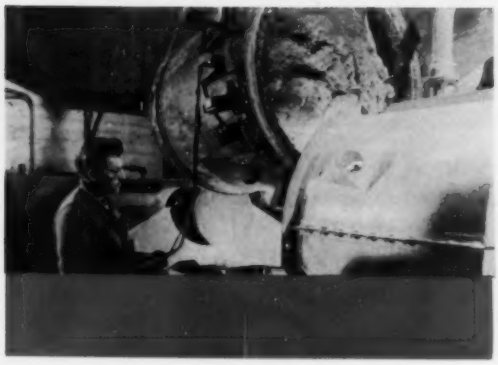
THE STEAM SEPARATORS are identified by their conical tops and directional vanes. They are of the cyclone type, which is a patented feature of CLEAVER-BROOKS evaporators, and remove entrained water from the steam, thus preventing contamination of the fresh water coming from this unit. The result is an extremely high purity of the fresh water product.

The rectangular objects at rear of photograph are the "Downcomers" which bring water down from the top of the steam separator. The tubes in left foreground are "Hotwells," which receive the distilled water discharge from the evaporator shell.

The IRON AGE



FEATURE ARTICLES

Will TITANIUM Ever Go Commercial ?

◆ Commercial reality, publicity mirage, or a luxury only defense can afford—how would you size up the commercial potential of metallurgy's current world-beater? . . . Most experts predict a bright future despite the present high price barrier . . . But the picture has its hazy side, too.

◆ This roundup combines first-hand reporting and a cross-section of expert opinion . . . Accepting the fact that titanium for defense is relatively old and steady business, it turns to the all-important future . . . It recognizes that titanium's future must tick commercially if it is ever to compete in a dollar-and-cents economy.

By P. M. UNTERWEISER, Metallurgical Editor

◆ Some people think you can't justify using the words "commercial" and "titanium" in the same sentence—maybe not even the same paragraph. In terms of price alone, they've got a fair argument. But they may be missing an important trend.

To pinpoint this trend, THE IRON AGE recently surveyed the first-hand experience, as well as the opinions, of leading titanium producers and fabricators. As a result, it is able to present in direct quotation selected portions of responses received.

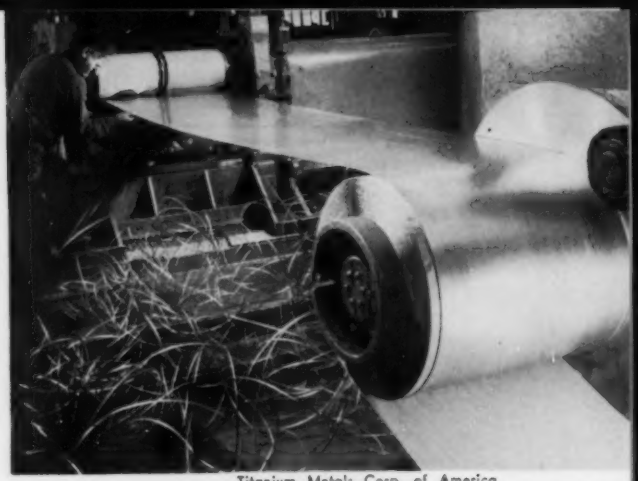
How does the commercial titanium picture size up? Based on survey results, titanium not only appears to have an established position in defense applications—but a strong commercial future as well. In the face of ever-increasing defense demands, the commercial possibilities

have been pretty badly squeezed, but they're still very much alive. What the commercial titanium picture needs and needs now is a bit of encouragement.

Unless you consider debate a form of encouragement, you'll have to admit that titanium's future has received a lot more of one than the other. As an issue in the metalworking industry, it is split right down the center.

The booster's view is filled with excellent prospects, continued expansion. Others—equally qualified to judge—forecast a dim future. Whenever titanium gets off the ground, say the pessimists, it will do so in aircraft—and at government expense.

There remains a third group—numerically the largest—which isn't committing itself. In the main, this is the vast industrial audience. Depending upon which set of predictions you prefer, this is the group that either *will* or *will not* do the buying. In anybody's metallurgical crystal ball, it is plainly the most decisive and least predictable factor. Amenable to both camps, no one has yet succeeded in nudging this buying potential from its place on the fence.



Titanium Metals Corp. of America

CONTINUOUSLY rolled titanium strip is automatically slit to specified widths on large scale.

What's behind the fence-sitting? Most opinions, whether factual or frivolous, point to price. Nobody seems to doubt titanium's inherent usefulness, its ability to improve the performance and extend the life of hundreds of industrial and consumer products.

Lightweight, strong, corrosion and heat resistant—each of these properties is a natural selling point. Under more favorable conditions, corrosion resistance alone could have made

Are Mill Facilities Short ?

◆ *Do you agree that a shortage of rolling and drawing facilities is the major bottleneck in current titanium production?*

◆ **"The question suggests that a shortage of production facilities is a major bottleneck. We have not engaged in commercial rolling of titanium but we have produced titanium forgings on a commercial basis and have the capacity to produce beyond our present rate, which is limited by orders received. Probably a backlog of open market demand for other types of mill productions would reveal facilities available for their production."**

S. E. Maddigan,
Asst. Director of Metallurgical Research,
Kaiser Aluminum & Chemical Corp.

◆ **"Looking at the tonnage and types of titanium being specified today, we question if there is currently any real shortage of mill processing facilities. Even for the near-term future, in connection with such production, we feel existing facilities and those in prospect should be reasonably adequate. We are encountering a demand, however, (fortunately not required for some time) for material of such physical properties and sizes as unquestionably will require additional rolling and processing facilities."**

C. E. Roberts,
Manager of Sales,
Alloy Steel Div., Republic Steel Corp.

◆ **"Melting capacity is even more short—and is specialized. Titanium can be handled on stainless steel fabricating facilities, but can only be melted in special vacuum furnaces."**

John H. Durant,
Business Manager,
Research Div., National Research Corp.

◆ **"No, we currently have no shortage of rolling and drawing facilities. The present bottleneck is melting capacity which arose from an unpredicted upsurge in defense requirements.**

titanium a kind of byword for the chemical and food processing industries. Even the pessimists agree. Still, consumption by these industries amounts to little more than a trickle. Industrially, titanium is still the lightweight wonder with the dragging feet.

What *about* price? Initially, titanium prices were hopelessly prohibitive. Now, with gradually increasing production, they are only moderately so. Low priced mill products are now selling at $9 per pound, with a fair chance that they may drop to $6 within a year.

Prices slant downward

Still a long way from the bargain basement, the titanium price picture is not without its brighter side. Price trends have consistently slanted downward. At each level of reduction, new applications are encouraged to enter the field. This, according to one expert, is titanium's "see-saw future." Even a slight drop in price usually opens the door to a few more customers.

Principal thorn in the side of titanium's progress is still the fact that non-defense customers are too few and far between. Lack of customers tends to dampen the kind of mass production that could drastically topple price. But conversely—unless the price is right—

E. I. du Pont de Nemours & Co.

TITANIUM gate valve, 3-in. diam, is typical of those used for handling corrosive materials.

We are rapidly installing additional melting facilities to meet this demand."

G. E. Hutchinson,
Asst. Sales Manager,
Rem-Cru Titanium, Inc.

◆ **"Yes. Until suitable equipment is available, the best techniques, both quality-wise and cost-wise, for fabricating titanium cannot be developed."**

E. H. Bunce,
Technical Asst. to the President,
The New Jersey Zinc Co.

How About Separate Titanium Facilities?

◆ *Do you think the titanium industry is now ready to support its own fabricating facilities?*

◆ **"There can be no standardized answer to the question 'separate facilities for titanium vs. use of existing stainless-steel facilities.' Any attempt to generalize, by saying that only by separate facilities can costs be lowered and production made more efficient, could be very deceptive. Each company must individually examine its products mix to ascertain whether independent equipment could be supported. For example, a company whose major business may be in titanium sheet might find it overwhelmingly uneconomical and technically inefficient to maintain extrusion equipment for titanium. . . . "**

T. W. Lippert,
Manager of Sales & Technical Services,
Titanium Metals Corp. of America

◆ **"Yes, on a gradual basis, as such facilities are required. We have already installed some facilities, e.g., forging press, and are planning others for the near future. We are self-supporting in the sense that all fabricating costs are reflected in the selling price of mill products."**

G. E. Hutchinson,
Asst. Sales Manager,
Rem-Cru Titanium, Inc.

growth of non-defense applications is seriously curtailed. Titanium's major dilemma stems from this neat balance of contradictions.

Contrary to widespread belief, titanium sponge production is not the prime factor contributing to the metal's high cost. Refining techniques have moved along at a rapid pace. Facilities have been considerably expanding. The raw materials are relatively cheap and plentiful, not difficult to mine.

Mill costs are higher

Converting the sponge to the mill product is still price obstacle No. 1—and is likely to remain so for some time to come. (Though some experts continue to list expanded melting facilities as the industry's prime need.) Even if the price of titanium sponge (now $3.45 per lb) were to miraculously drop to zero, mill costs would still account for almost $6 of the current mill products' per pound selling price.

Titanium mill products are now, and have always been, the stepchildren of the stainless steel industry. With a single possible exception when they are produced at all, they are produced in mills and on equipment primarily intended for stainless steels.

With the current demand for stainless exceeding present capacity, titanium production is reduced to the status of an industrial hobby. The combination of low tonnage and absence of its own facilities helps to perpetuate its precarious condition. High prices simply reflect the effects of these determining factors. Faced with similar obstacles, it is doubtful whether any stainless mill product could be produced profitably and at a reasonable price.

But that's not all. Some titanium mill products require the facilities of more than one mill before they achieve completion. Depending upon the location of mill facilities, they are shunted about the country in the manner of the traveling circus. Transportation hither and yon is all a part of the final selling price.

Responsibility for these conditions does not rest with the stainless mills. If anything, they have made a priceless contribution to titanium's progress. Without their help, titanium production could never have gotten underway when it was most needed for vital defense.

But a temporary expedient is a poor substitute for a permanent fix. If titanium is to grow, it must be given a fair chance. How? Most experts agree that only an overall mill devoted exclusively to titanium products is likely to fit the bill. This—plus expanded melting facilities capable of meeting titanium's special requirements.

A fully integrated mill—combining melting and fabrication—would be tremendously expensive. To cover the cost of facilities, it would probably want to avail itself of rapid amortization. In an infant industry, such amortization is required to cover the possibility of early

◆ **"No, while aircraft uses of titanium are good, the commercial applications are primarily in the development stage and cannot carry the burden of fabricating facilities.**

L. W. Long,
Market Research Director,
Mallory-Sharon Titanium Corp.

◆ **"Assuming this is intended to mean completely separate and integrated facilities, we do not feel the industry is now ready to support such facilities. The financial investment necessary to attain such position would be so tremendous as to make it extremely unlikely, or impractical, in the foreseeable future.**

We believe that only the availability of steel mill facilities has made it possible to advance titanium development so rapidly, as well as help to bring about substantial reductions in price."

C. E. Roberts,
Manager of Sales,
Alloy Steel Div., Republic Steel Corp.

How To Help Commercialization

◆ *How can the metalworking industry help the commercialization of titanium?*

◆ **"The metalworking industry should perform a first-class public relations program which will remove the stigma that titanium is difficult to fabricate with currently available equipment and know-how. Their development people can also come up with better tools and dies. Improved case hardening and cladding methods will also allow for better titanium products."**

L. W. Long,
Market Research Director,
Mallory-Sharon Titanium Corp.

◆ **"By accepting the fact titanium does have commercial possibilities and setting out to de-**

equipment obsolescence. The U. S. has a five-year tax plan intended to fill this need.

Since at least 90 pct of the present market for titanium is restricted to military aircraft, helping to build the non-defense market is still the toughest job of all. It is a job that began in 1952 and to which most of the present titanium producers are contributing.

Current commercial applications of titanium are usually justified either because of the metal's unusual corrosion resistance or its highly favorable strength-to-weight ratio at temperatures up to 850°F. In the latter category, the firewalls and nacelles of the Douglas DC-7 airliner are among the only well-known non-defense applications. True, these are aircraft applications. But the advantages they offer technically and in terms of safety show promise of extended use in a commercial field.

Chemical applications are quite numerous and are frequently easier to justify on a strictly dollars-and-cents basis. In the chemical field, stainless steels are usually the materials titanium has to beat in order to gain a

▲ Mallory-Sharon Titanium Corp.

ULTRASONIC testing equipment detects possible flaws or imperfections in large titanium ingot.

velop all the data needed to determine the probable problems encountered in its fabrication, to initiate experimental development work in their own plants, to enlist the technical assistance available from producers on grades, product characteristics, areas of likely application, etc."

C. E. Roberts,
Manager of Sales,
Alloy Steel Div., Republic Steel Corp.

◆ **"The metalworking industry can help the commercialization of titanium by continuing, on an increased scale, to publicize and advertise their know-how in titanium fabrication. More and more we are noticing that metal-goods manufacturers (i.e., equipment, fittings, etc.) are stating in their advertising copy that their products are available in titanium metal. This is all to the good because general application will further increase as the sources for standard articles are widened. During the next few years, we believe that process-type applications will be much further developed as present units in service by that time will have shown impressive performance records."**

L. J. Barron, Applications Engineer,
Specialty Products Section,
E. I. du Pont de Nemours & Co.

Future Applications

◆ **"As the price of titanium continues to decrease, numerous and diverse non-defense applications increase. This has been historically true in other metals, and already evident to a modest extent in titanium. These many present and potential non-defense applications make up a list of impressive proportion. Other than the obvious uses, in chemical-processing equip-**

foothold. To do so, titanium is often dependent upon such factors as plant downtime and replacement charges—as well as superior corrosion resistance.

Du Pont's L. J. Barron, who has been following titanium's commercial potential in the field, provides a typical case in point. Titanium recently replaced Type 309 stainless in a thermowell installation in hot nitric acid service.

Good for about 6 months' service, the stainless well cost $95. Replacement charges in labor and downtime amounted to $1250. Since a titanium well could provide at least 5 years of service without replacement, its $300 initial cost was easy to justify. This particular switch resulted in savings estimated at $12,850 over a 5-year period.

Commercial picture broadens

The paper industry has shown a willingness to pick up the tab for titanium in its chlorine dioxide mixers. For brighter whiteness and less fiber degradation, chlorine dioxide is considered an ideal bleach. But it is particularly tough on stainless steels, especially in abrasive slurries. In some instances, high-alloy stainless components—such as baffles, nozzles, and valves—were being replaced after only 5 hours of service. Substitute parts made of titanium are still satisfactory after 13 months.

Food processing applications show considerable promise, although the fact that everyday foods should present so serious a corrosion problem may come as a surprise to the eating public. Such commonplace tablefare as dill pickles and tomato juice are prime offenders. For that matter, any food product containing reasonable amounts of brine and lactic acid is an impressive stress corrodent at cooking temperatures.

The corrosion problem in commercial food processing is double-edged. Not only is processing equipment attacked to a degree requiring replacement, but the by-products of corrosion frequently promote the adulteration of the taste or color of the food itself.

Here, again, titanium is beginning to show a profit. Tests indicate that titanium is wholly inert in such diverse media as tea and tomato juice, sauerkraut and India relish. Equally important, the metal doesn't affect flavor or color.

The titanium industry now has thousands of titanium test samples in a variety of industrial fields on an experimental basis. Some of the applications may be expected to trip on the current price obstacle, but quite a number are likely to prove worthwhile. The potential is spread over a sizable cross-section of industrial strength. Marine, automotive, electronic, chemical—even electroplating applications—are being scrupulously checked.

Provided with adequate mill facilities compatible with a growing demand, it is a better-than-even bet that titanium will make its mark commercially. Right now, it could do with that extra bit of encouragement.

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ment, etc., there are, today, such unexpected applications as anodizing racks, high-speed camera shutters, wire for cutting battery extrusions. Strong and aggressive marketing departments are constantly encountering and developing new outlets."

T. W. Lippert,
Manager of Sales & Technical Services,
Titanium Metals Corp. of America

◆ **"It is our feeling that what we have here today on titanium as regards commercial applications is quite similar to what we faced in the early stainless steel history. We need to get titanium as quickly as possible in all fields of likely practical interest so as to get long-time actual service condition test results. We need more installations such as the Du Pont 'well' mentioned by you where corrosion conditions limit the service life and where high cost of replacement and shut-down time is of such material financial importance as to offset or go far beyond the increased initial cost of the titanium metal. In this connection, consideration should be given to its testing or experimental use in areas where present prices can be discounted substantially, looking back at the frequency and extent of price reductions to date.**

"We feel, also, the need of continuing reports through publications such as yours to the industry generally on the substantial progress being made regularly by the titanium producing industry, so as to encourage interest and lend assurance that fabricating problems are being solved."

C. E. Roberts,
Manager of Sales,
Alloy Steel Div., Republic Steel Corp.

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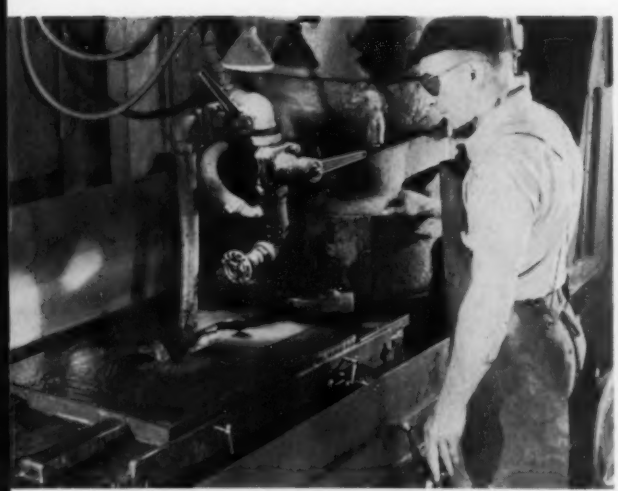
Almost no distortion—

Surface Grind Wide Swath In One Pass

◆ SURFACE GRINDING of small power saw tables proceeds at 8 to 12 hourly, with help of a massive vertical spindle grinder that spans the full workpiece width. Saw tables cast from gray iron travel beneath a fixed grinding head 32 in. diam. Production costs for the job run 60 to 70 pct less than those possible by other methods.

Continuous self-dressing of the grinding wheel takes place automatically. This largely eliminates machine downtime, and holds idle time to that necessary just for load, setup and unload operations.

Saw tables ground at the Bellefontaine, O., plant of Delta Power Tool Div. Rockwell Mfg. Co., measure approximately 18x24x1½ in. thick in one size, and 28x38x1½ in. in another. Both are gray iron castings. Tables incorporate four short mount pads, one located on the under side at each corner.



IN ONE PASS, surface grinder cuts 32 in. wide path. Up to 0.060 in. is removed from saw table top, then flat within 0.005 in. tolerance.

Each table has a "throat" through which the saw blade or other special rotary tool protrudes. Two channels or slots act as slideways for blades of cutoff and mitering gages used in connection with the woodworking saws. Parts being worked slide over the saw table top. A good finish is important, as is minimum warpage in the table.

Castings are not normalized before grinding. Thus a certain amount of stress and strain around the outside edge makes the part difficult to grind, lest warpage be met during the grinding job.

Uniform wheel pressure essential

Grinding wheel pressure must be uniformly distributed over the entire surface. This in order that saw table sections fully supported by the grinding table will in turn provide firm support for the grinding wheel. In grinding, the table deflects little if at all due to localized grinding-wheel pressure.

A massive, vertical-spindle grinder incorporating a traveling table 28 in. wide meets these several requirements. The machine wheelhead accommodates either a cylinder or segmental wheel, with a face 32 in. overall. Mattison Machine Works, Rockford, Ill., supplied the equipment.

The wheel face completely spans the full work table width with a margin to spare on either side. This permits engagement of the entire surface of the workpiece at each pass.

In the table grinding operation at Delta, the wheel rotating at 800 rpm removes approximately 0.060 in. of stock. Water-base coolant is used. Flatness checked on each table with a surface plate and feeler gage must fall within 0.005 in. from corner to corner.

The same machine grinds mount pads on the under side of saw table tops. Table top surfaces are ground first, followed by all mount pads. Currently, grinding equipment turns out 8 to 12 finished saw tables hourly.

Features accuracy—

Broaching Does Fast Job On Slots and Odd-shaped Holes

◆ Producing odd-shaped parts in big quantities isn't easy, as a rule . . . But broaching solved a couple of these knotty problems for GM's Saginaw Steering Gear Div.

◆ One twin broach machine boosts output by putting elliptical holes in four parts at one time . . . And where form grinding isn't feasible on hardened, contoured slots, another broaching setup fills the bill.

By W. G. PATTON, Engineering Editor

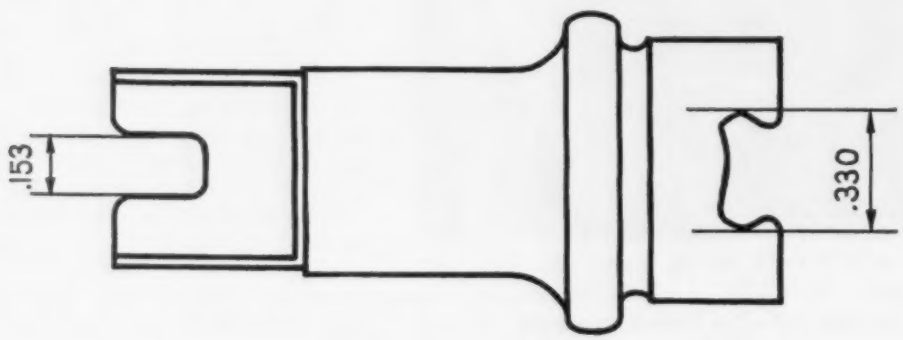
◆ FAST, accurate broaching counts heavily in the production of more than 5000 power steering units per day at Saginaw Steering Div., General Motors Corp.

Speed of the broaching process helps keep volume output in line with an ever-increasing demand; its accuracy helps insure that each power steering unit will be absolutely safe and trouble free in operation.

One of the components requiring special broach tooling is a pump ring in which an elliptical center hole must be machined. Shown in an accompanying sketch, this ring is joined

Operations On Valve Actuating Lever

1. Form, face and cutoff on 8-spindle automatic.
2. Green grind O. D.
3. Broach tang slot and dovetail.
4. Heat treat, wash, draw and tumble blast.
5. Finish grind O. D. as specified.
6. Finish broach dovetail (no grinding).
7. Grind straight slot to required size.
8. Grind spherical radius as specified.



SPECIAL broaching setup elongates locating hole in pump ring. Tool is removed after down stroke.

TWIN broaches on single ram machine make elliptical center hole in four pump rings at a time.

to the pump body and cover in final assembly.

Surfaces of this precision cast Armasteel pump ring casting must be finish ground accurately to permit large volume assembly and avoid leaks in service. Location of holes must be precisely held and finish grind of the large, elliptically shaped hole must also be very accurate to insure satisfactory operation of the pump.

A detailed list of operations is shown in the accompanying schedule.

A snap gage is used to check the castings as they are received.

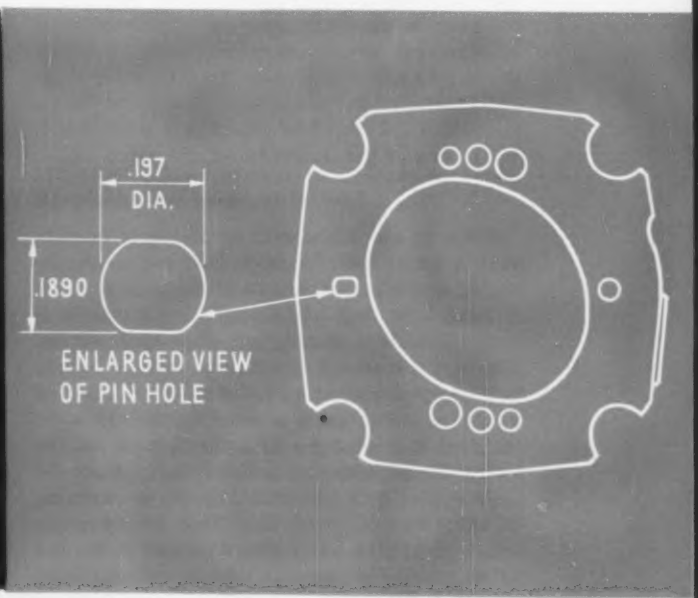
After the castings are rough and finish ground on both sides, the elliptical center hole in each is broached in a single ram, pull down broaching machine equipped for two broaches. Parts are stacked two high, so each stroke of the machine processes four pump rings.

An identifying, projecting arrow cast on the side of each ring prevents misloading and protects tools against accidental breakage. During the broaching operation, approximately 1/16 in. of metal is removed.

Previously, a cam-controlled boring machine was used for this operation. Production aver-

Operations On Pump Ring

1. Gage for thickness and hole location.
2. Rough grind both sides.
3. Broach elliptical center hole.
4. Drill 8 holes and ream 2 holes.
5. Broach pin hole to elongated shape.
6. Heat treat.
7. Semi-finish grind both sides.
8. Finish grind both sides.
9. Cam grind elliptical center hole.



ELLIPTICAL hole in center of each pump ring is ground to precise dimensions after broaching.

aged about 226 pieces per hour. The new broaching operation produces up to 400 pieces per hour. Tool life has reached 10,000 pieces per grind but tooling changes now under development may result in even lower tool cost. Whereas interruptions to production were fairly frequent using the earlier method, continuity of production has been quite satisfactory since broaching was adopted.

After broaching the elliptical center hole, a total of 8 holes, ranging in diameter from 0.1885 in. to 15/64 in., must be drilled and reamed in the pump ring. For accurate final assembly of all three pump parts (cover, body and ring) location of the holes must be closely held.

As a matter of fact, assembly of the parts creates the second problem involving an elongated hole in this particular piece. During assembly, one of the round holes in the rim of the ring is used for locating. However, some enlargement is necessary to facilitate fitting the parts together. This is the reason for elongating one of the holes from 0.1885-0.1895 in. to 0.197-0.202 in. The elongation must be at 45° to one of the diagonals of the piece.

Special machine was designed

Since no machines were available to operate such a small tool, Saginaw Div. engineers designed a small hydraulic machine to do the job. A broaching tool of the pull down type was built. This tool is removed after each stroke. The part is loaded in the fixture and the broach is inserted down through the hole and into the machine. A button is pressed by the operator, the tool is picked up by some fingers on the hydraulic machine and pulled through the hole.

Following heat treatment, resulting hardness of the rings is 49-55 Rc. Heat treatment is followed by 100 pct inspection and semi and finish grind. Thickness is held to ±0.0001 in.

Two different type machines are presently being used for the final grind of the elliptical hole. A 4-station, cam-controlled machine processes two pieces simultaneously at each station. After loading, the large hole is rough ground, semi-finish ground and finish ground at subsequent stations on the machine.

Production rate for this operation is 200 pieces per hour. Approximately 0.006 in. of stock per side is removed during the three operations. In this machine, the parts rotate in the fixture. This movement is timed by means of a cam with the wheel head which is attached to a slide. Grinding wheels have automatic dressing.

A standard grinding machine has also been adapted for the same operation. In this machine, the elliptical opening is ground, one piece at a time. Automatic wheel dressing is provided at regular intervals. Standard gaging is used to check the parts periodically.

Another of the unusual problems involved in producing the division's 1956 power steering unit was the production of the valve actuating lever. Rough machining includes broaching a straight-sided notch in the tang end of the lever, and an irregularly shaped dovetail notch in the opposite end. After rough machining, the part is oil quenched from 1550°F and tempered to 40-45 Rc.

Broach a hardened surface

Since unusual accuracy is required, finish machining must be performed in the hardened condition. The small, straight notch is finish ground. However, the wider dovetailed notch presented a difficult problem since final form grinding was not a practical solution. Dimensions had to be closely held and a good surface finish was also necessary.

After considerable study it was decided to use a special pull down, segmented broach for this notch-finishing operation. The tool segments are staggered on one side and then on the other. The operator, loading 2 pieces at a time in a hydraulically clamped fixture, averages 350 pieces per hr at 80 pct efficiency. Both overall width and centrality of the dovetail have been adequately maintained.

Experimental work with several tool designs has indicated that the use of a segmented tool of this type not only gives improved accuracy but also has the following additional advantages: (1) longer life, (2) simple adjustment to compensate for wear, (3) ability to replace any segment that is damaged rather than replace the entire tool, (4) better surface finish.

These tooling developments are part of the firm's program of (1) acquiring equipment to handle a growing volume of work, (2) anticipating engineering changes, and (3) tooling for volume production of an increasing variety of odd-shaped steering gear components.

Composite Die Sections Trim Cutting Costs

◆ DIE SECTIONS formed by backing up tool steel with a non-hardenable carbon steel are reported to be yielding savings up to 40 pct on sheet metal cutting applications.

Jessop Steel Co., Washington, Pa., produces the material by the double cast method. This involves casting the water hardening tool steel from an electric furnace, in insert form. After cleaning, the tool steel is then keyed into the ingot mold and low C steel is poured around it. Jessop then rolls the material to finished shape as one single section.

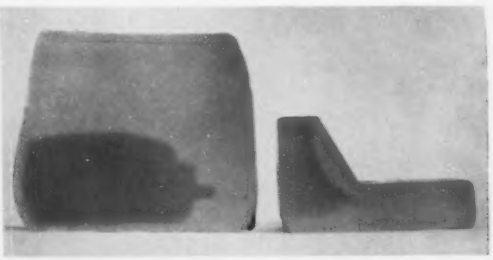
There are many uses for the rolled bar steel shapes, which are recommended for straight or slightly bent die sections. These include dies for airplane metal sheet shapes, auto bodies, refrigerator panels, metal toys, railroad cars, metal containers and truck bodies.

Besides initial low cost, other advantages cited for the material include (1) improved shock resistance, (2) ability to drill dowel and screw holes after hardening, (3) easier machining and lower machining costs, (4) availability of sections in precise lengths wanted, (5) ability to bend forms, saving material, time. (6) No necessity for cutting from solid blocks.

Heat treatment recommended for the water-hardening steel involves quenching from a temperature range of 1425° to 1450°F in salt brine solution.

This is followed by a draw at 375°F, allowing one hour for each inch of thickness.

THIS 600-ton Clearing press can turn out 300 truck panels per hour for Budd Co. Composite sections are used on trimming edge of the die.



ETCHING brings out contrast between tool steel (dark area) and non-hardening steel in die.

FIRE BOMB gets finishing touches preparatory to testing for leaks under air pressure.

Mostly Sheet Material—

Weld Aluminum Two Ways in Mass Production Setup

◆ Mass production of 13 ft long aluminum fire bombs depends on a lineup of 20 manual and semiautomatic welding stations . . . Fabrication of nose, center and tail sections requires 17 welded joints.

◆ Some welds are made by the gas-shielded tungsten arc technique, using filler wire feeders . . . Others call for the gas-shielded metal arc process . . . Both manual and semiautomatic methods are used.

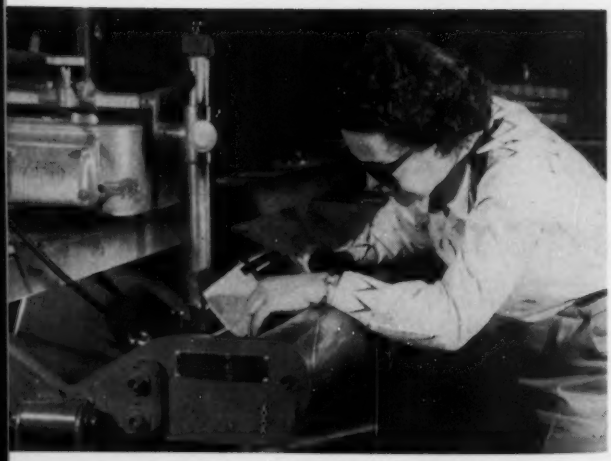
By L. W. KUNKLER
Process Representative,
Pittsburgh District,
Air Reduction Sales Co.,
New York

◆ TWENTY welding stations are key points in a high-speed setup for producing aluminum fire bombs at Evans Reamer & Machine Co., New Lexington, Ohio.

Bombs fabricated on this important government project are 13 ft long and 18 in. in diam. They are shipped in three separate sections: nose, center and tail. Chief material for the various components is 61S aluminum, 0.051 in. thick.

Welding of 17 different joints is required for each bomb. Joining is done by both the gas shielded tungsten arc method (with filler wire feeder) and the gas shielded metal arc technique. Both processes are applied either manually or semiautomatically, depending on the joint and the weld requirements.

Bomb production starts by rolling straight



Top: **SEMIAUTOMATIC machine moves along longitudinal seam of cone section at 40 ipm.**

Bottom: **GROUPING of controls makes it easy for operator to control welding of sealing rings.**

lengths of aluminum sheet into rings which serve as basic structural components. Rings are bevel cut with a saw so that they can be single-vee butt welded. This is done at two identical stations with manual Aircomatic units, each powered by a 500-amp, constant arc voltage machine. Jigs hold the rings round and flat. High welding speeds prevent annealing of the rings, thus making costly post-weld heat treatment unnecessary.

Next, sheet for the skin of the nose and tail sections is sheared and rolled into conical shapes for longitudinal butt welding. Two semiautomatic Heliwelding installations handle these joining operations.

On the nose section, for example, a torch mounted on a motor-driven carriage moves along the seam at 40 ipm. The filler wire feeder lays 43S aluminum wire into the joint at 80 ipm, within a gas shield of 25 cfh argon, 210 amp dc, reverse polarity.

After longitudinal seams in nose and tail sections are welded, a special bulging fixture forms the conical shells to specified cylindrical shape.

Nose and tail sections then require circumferential welds to join bulkheads and sealing rings to the outer skin. All controls for these girth-welding machine operations are grouped for easy handling.

Next, circumferential welds are made simultaneously at both ends of the center section. These also join sealing rings to the skin. A special machine mounts twin torches which make these girth seams at 20 ipm. Filler wire feed is 65 ipm.

Final production operation is the manual welding of a filler cap adapted to the tail section.

Finished nose, tail and center sections are tested under air pressure. Completely assembled bombs also get compressed air tests at the discretion of government inspectors.

With the present setup, Evans Reamer can produce 3000 bombs monthly, consuming about 2000 lb of rod and 50,000 cu ft of argon.

ALL WELDS are checked carefully to weed out even the slightest imperfections. Operators stamp number on each seam so that faults can be traced easily and corrected at source.

The right answers—

Low-Cost Techniques Simplify Special Bends in Stampings

◆ Each type of bending job on metal stampings has its special problems . . . Take louvering, lancing, multiple bending, and bending combined with other press operations . . . Best results depend on application of specific design and press techniques.

◆ Here are the formulas, hints, and alternate methods to provide a successful solution to almost any special bending problem . . . They emphasize practical, cost-cutting ideas . . . Simple, but graphic sketches illustrate each point.

By FEDERICO STRASSER, Consultant, Santiago, Chile

◆ Bending of metal stampings covers a lot of tricky territory. Partial bending, lancing, louvering, compound bending—all are parts of the big picture. So is the bending task that must be done simultaneously with other operations. Still other important items: contoured parts that must be bent, and jobs that require holes to be made in bent workpieces.

Each of the foregoing operations has its special problems. As you might expect, there are right and wrong ways to attempt their solution.

Consider partial bending, for example. As shown in Figs. 1 through 10 it involves bending only a portion of the stamping. If the bend line coincides with the edge of another section of the blank, then the technique shown in Fig. 1 is incorrect because cracks, tearing and at the least, heavy distortion, can occur at the critically stressed points indicated by arrows.

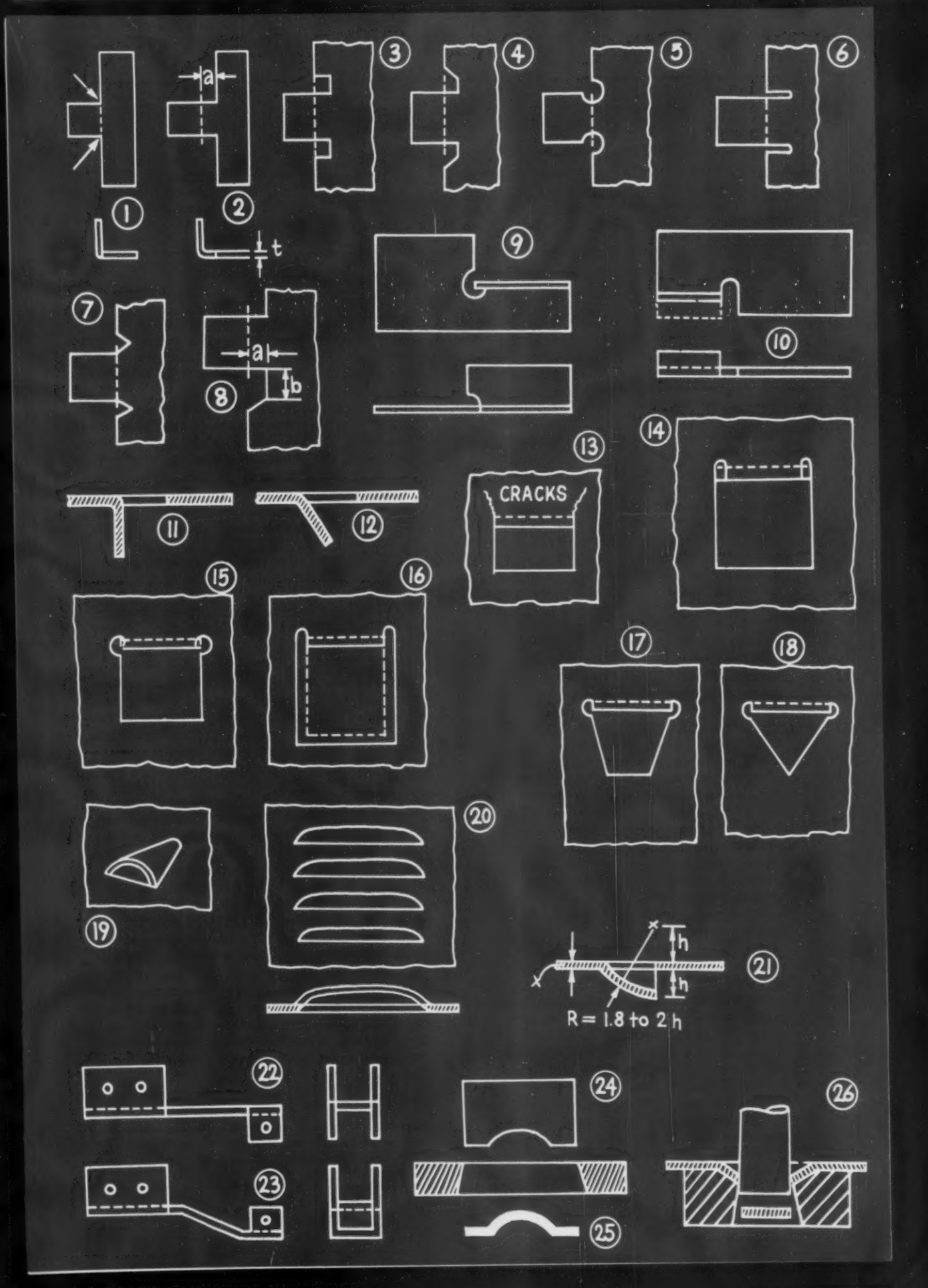
Best solution is to locate the bend outside the edge of the remaining blank section as shown in Fig. 2. However, distance "a" must be at least twice the stock thickness.

But when the bend line cannot be changed, proper stress relieving slots must be punched at the corners where the blank sections join. Caution: slots that are too large weaken the stamping unnecessarily, while those that are too small may prove difficult and expensive to make. The rectangular, trapezoidal and semi-circular slots of Figs. 3, 4 and 5 are usually preferred. Narrow (Fig. 6) and triangular (Fig. 7) slots are definitely wrong because die construction and maintenance is too troublesome.

Flaps create stress problems

Lancing, the process of cutting and forming flaps or ears in a stamping or piece of sheet metal, present some corner-stress problems akin to those found in partial bending. In a typical lancing job, the punch not only cuts or slits three

Three previous articles in THE IRON AGE *give the author's practical tips on stamping design and production: Blanking—March 15, 1956, p. 83; Piercing—April 5, 1956, p. 108; Simple Bends—May 3, 1956, p. 100.*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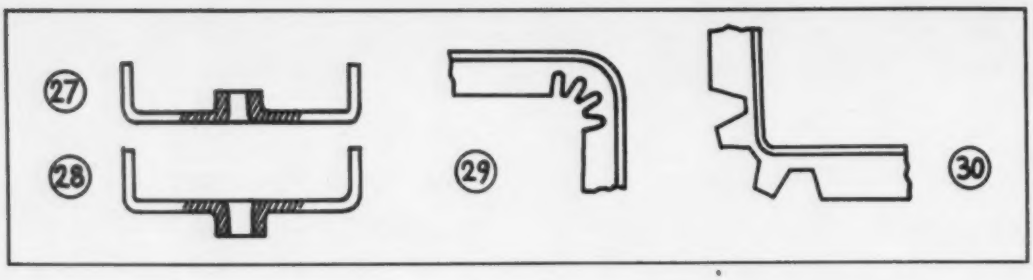

sides of the flap; its internal face is shaped so that it also bends the flap downward as it descends. (Fig. 11).

Normally, 90° is the maximum flap-bending angle. It is also the one used most frequently because of die simplicity. However, angles of less than 90° (Fig. 12) should be preferred because less pressure is required and less stress is imposed on the metal.

If the metal to be lanced is somewhat hard or thick (over 0.08 in.) points of maximum stress can crack or break (Fig. 13). Solution is to provide relief with notches (Fig. 14), round holes (Fig. 15), or clearance slots around all three sides of the flap (Fig. 16). Width and depth of these relief openings should be about twice the stock thickness; never less than 0.03125 in.

If function of the flap will permit, best design is a tapered (Fig. 17) or triangular (Fig. 18) form. Reason: edges will not stick to the side walls of the die plate opening. Thus workpieces can be removed from the die quickly and easily.

Bend at right angle to rolling

To avoid distortion, minimum flap height should be two to four times stock thickness. For adequate strength, the flap bend should be at a right angle to the direction in which the stock was rolled, or at least at 45° to this axis.

Louvering uses a single punch to do gradual straight line slitting followed by a laterally curved expanding operation (Figs. 19 and 20). It doesn't permit punching notches or holes to relieve critically stressed points. Best way to avoid stress trouble is by using punches with properly designed streamlined ends, plus rather thin material. Profile view in Fig. 21 gives the proportions of maximum louver dimensions for soft steel sheet, according to best practice.

The task of multiple or compound bending is expensive and should be avoided by product designers wherever possible. It inevitably means either separate operations for each bend (or couple of bends), or the use of complicated dies.

Sometimes, the need for compound bending can be eliminated. For example, Fig. 22 shows the original design of a part and Fig. 23 offers a modified form of the same component.

The original design required two double bends in opposite directions. In the modified form all the bends are in the same direction and can be made in one press stroke with a comparatively simple die. And the relative position of the three holes remains unchanged, which is all that really matters in this case.

Bending can often be done simultaneously with other press operations to increase production and cut costs. For example, Figs. 24 and 25 show that large angles or curvatures of large radii can be made by properly inclining the cutting edges of blanking punches. Or countersinking a punched hole can be accomplished by making a properly shaped and tapered crater at the die plate opening, Fig. 26.

Fig. 27 shows the correct one-operation way to emboss an extruded hole while simultaneously bending the two legs to a "U" shape. Fig. 28 is the incorrect way because it requires two operations.

Contour forming—the bending of rolled or extruded "T," "I," "U" or irregular sections—offers the usual bending problems plus those stemming from deformation of webs and flanges. In convex forming a channel, for example, the excess metal on the outside of the bend is subject to tearing and cracking while metal inside the bend tends to wrinkle and undulate.

To reduce or avoid such troubles, the designer can use an intelligent combination of these preventive measures: (1) select thick-walled sections; (2) use hot rolled, highly ductile metals; (3) keep web height to a minimum; (4) make bending radii three to four times web height for soft metals; six to eight times web height for hard metals; (5) notch the points where maximum stresses are created (Figs. 29 and 30).

Bending stampings that contain pre-punched holes presents the problem of avoiding hole distortion. Good practice is to keep hole edges a safe distance from the center of the inside bending radius: at least twice the thickness of the stamping stock. If a hole must be closer to the bend line and still remain round, it may be necessary (and expensive) to punch it after the bending operation.

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Newport Steel

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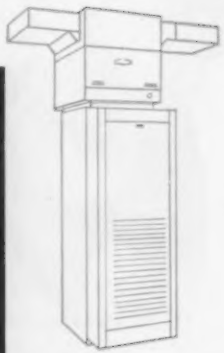

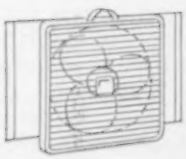

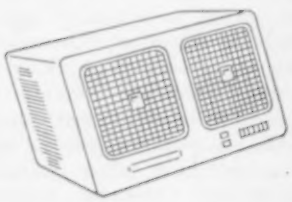

As a supplier of integral steel products to manufacturers of heating, ventilating and air conditioning equipment, Newport Steel contributes widely to today's increased comfort and efficiency in office, factory, store and home. Many other prominent industries also find in Newport a most effective combination of precision control, flexibility of operation, and central location for economical, dependable delivery. The recent installation of modern new facilities is another step toward the complete integration of this 70-year-old mill, and provides consistent reliable service on all the products listed here.

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New Technical Literature:

Catalogs and Bulletins

Fastener standards

Revised 30-page catalog carries tables showing new screw size ranges and specifications. It shows number of threads per inch, length, and quantities per package for socket head cap screws. Punched for loose-leaf binding, it gives regular, giant and microsizes; regular microsize socket set screws; square head set screws; stripper bolts; flat head socket cap screws; button head socket cap screws; socket head dryseal pressure plugs; precision ground dowel pins; and socket screw keys to fit all types and sizes of SPS socket head fasteners. *Standard Pressed Steel Co.*

For free copy circle No. 1 on postcard, p. 133

Profilometer catalog

Profilometer equipment for shop measurement of surface roughness is given in a 14-page catalog. Easy reference section covers (1) equipment for manual operation, (2) portable equipment for straightline mechanical tracing, (3) equipment for straight-line mechanical tracing on hard-to-reach surfaces, and (4) equipment for circular tracing. Other sections cover equipment for recording microinch roughness readings, and unusual equipment application. *Micrometrical Manufacturing Co.*

For free copy circle No. 2 on postcard, p. 133

Silicone brochure

Release of a new 8-page brochure featuring silicone rubber products and silicone coated cloths gives specifications on the various silicone compounds available. Bulletin provides Silicone Rubber properties data as well as resistance qualities. Limitations and service recommendations are covered. Government specifications which various compounds meet are also listed. *Raybestos-Manhattan, Inc.*

For free copy circle No. 3 on postcard, p. 133

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 133.

Plastic pipe, fittings

Two types of unplasticized polyvinyl chloride pipe and fittings are described in this bulletin. One is a normal impact grade, and the other a high impact grade. It gives a general description of both and their specific advantages. Applications are listed by industry and process. The full range of corrosion resistance is defined. Tables give physical properties, dimensions and weight, maximum working pressures, types and weights, burst pressures, and thermal expansion and contraction. Installation instructions are given on cutting, threading, threading compounds, assembly of threaded joints, solvent cementing, bending, hanging and thermal compensation. *Alloy Tube Div., Carpenter Steel Co.*

For free copy circle No. 4 on postcard, p. 133

Die cushion line

Now available, this 24-page catalog shows die cushion types for presses with J.I.C. bed openings from 14 x 14 in. to 213 x 87 in. Included are pneumatic, multiple piston pneumatic, pneumatic locking, hydropneumatic and custom type cushions, ranging in capacity from 3.93 tons to 301.5 tons, at 100 psi. Catalog provides complete performance and dimensional data on all cushions. Book includes recommended formulas for computing cushion capacities, and specific cushion arrangements. *Danly Machine Specialties, Inc.*

For free copy circle No. 5 on postcard, p. 133

Bearing stock list

Showing a 50 per cent increase in one company's bronze bearings, a new stock list has been issued. A total of 1050 different sleeve, flange and thrust bearings appear. "This is the largest selection of sizes of self-lubricating bronze bearings available from any source," a company spokesman has said of the listed items. Bearings are for use in automotive, industrial, aircraft, home appliance fields, etc. *Amplex Div., Chrysler Corp.*

For free copy circle No. 6 on postcard, p. 133

Coolant systems

Lubrication and coolant systems are illustrated in a four-page bulletin containing pictures of installations. Custom designed it tells how they supply correct lubricant amount to the right place at proper temperature and pressure. It describes provision of maximum protection at vital gear meshing points and bearing surfaces. It also shows compact, packaged lubrication systems for full pressure feed lubrication system in capacities up to 50 gpm. *Dravo Corp.*

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Grinding wheels

Manufacturer of surface grinding machines and grinding accessories has made available catalog section covering line of surface grinding and bench grinder wheels. It contains data explaining grinding wheel code numbers or "markings." Composition and applications of fundamental types of wheels are described. *DoALL Co.*

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All-crop drill

All-crop drill for grain drilling, grass seeding and fertilizing is illustrated in recently released literature. Accuracy at high drilling speeds, separate band placement of seed and fertilizer and uniform depth seeding and fertilizing seem to be key features. Reading matter showing higher yields with less seed and fertilizer output should be valuable to those affiliated with agriculture and the farm implement industry. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 9 on postcard, p. 133

FREE TECHNICAL LITERATURE

Plastic tooling

"Why Plastic Tooling?" has been published telling how tooling compounds based on one company's epoxy resins can simplify model changeovers for many manufacturers by providing inexpensive, easy-to-build jigs and fixtures, forms, patterns and dies. For each of the 39 applications listed in the mailer, tooling compounds based on epoxy resins reduces need for skilled labor and eliminates the need for much costly machining, according to the company. In some cases, tooling costs can be reduced 80 per cent, they say. Epoxy resins cure at room temperature, hold tightly to inserts, bond directly to backing structures and adhere strongly to reinforcing materials. They make possible close tolerance design since the resin's dimensional stability remains throughout tool life. *Bakelite Co., Div. of Union Carbide and Carbon Corp.*

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New platen press

Color illustrated 4-page brochure describes platen press applications for metal drawing, metal forming, plastic and ceramic molding. Literature covers new Rodgers "Fast Acting" hydraulic platen presses of the 50 to 400 ton capacity range. *Rodgers Hydraulic, Inc.*

For free copy circle No. 11 on postcard, p. 133

Monorail equipment

New 12-page catalog describes electrical equipment for cranes and monorail systems, including copper wire, bar, T-bar and enclosed conductors. *Industrial Crane & Hoist Corp.*

For free copy circle No. 12 on postcard, p. 133

Wire forming

Brochure entitled "Wire Forming Specialists" describes company's ability and facilities for pointing, forming, stamping and finishing of products and components made from 0.015 to 0.250 in. diameter wire. In addition to formed wire products it shows pointing, threading and other wire end operations. *Risdon Manufacturing Co.*

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J&L SHEET STEEL ON ANOTHER *Important* JOB

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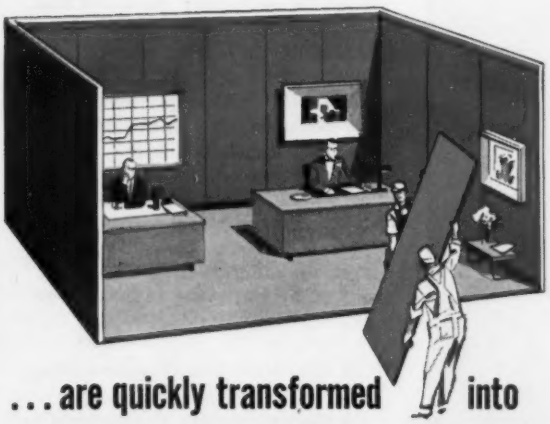
Crowded, inefficient general office areas



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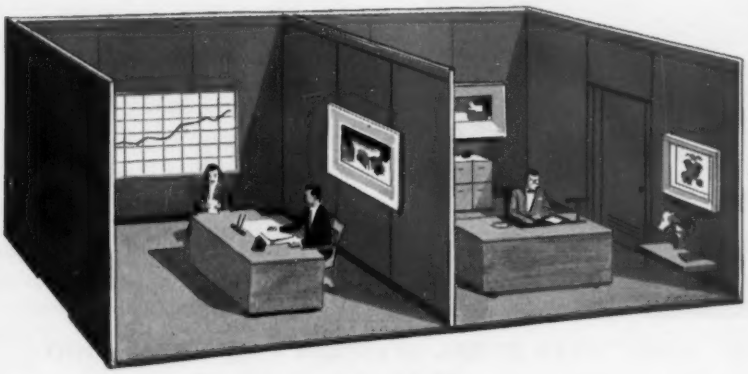

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Steel interior walls, easily installed and quickly rearranged, provide business management with an efficient means of allocating expensive floor area to keep pace with changing space requirements.

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J&L success in meeting their demands is the result of rigid quality control during production, coupled with a thorough understanding of product end use.

If you fabricate sheet steel, this formula for successful service can be applied to your requirements. Whatever your specifications for uniformity in workability, formability and drawing properties, you can depend on J&L sheet steel. It will help you get the best out of your production equipment and add to the value of your finished product.

Jones & Laughlin
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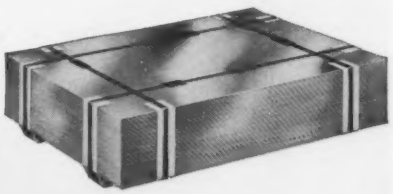

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Once upon a time there was a tool salesman who never had it so good in his life. He had a big account that used so many small production tools that the account was not only his bread and butter but also his steak and potatoes. He used to call on this account once a week, on his way to the golf course, to pick up a good sized order to replace the expensive tools that had been worn out.

One day he called and the order was much smaller than it had ever been. When he asked why, he found that the production department had switched from regular steel to Copperweld Leaded Alloys—the steels with "built-in productivity." The salesman knew that the faster feeds and speeds and easy machinability of these leaded alloys had done him in because the tool life was going to be increased as much as 10 times. He could see his handicap going up from 6 to 16 because he was going to have to go back to work.

P. S. The story has a happy ending. Everyone in the plant is delighted with the results from Copperweld Leaded Alloys, and the salesman found another account that had yet to learn of the advantages of Copperweld Leaded Steels—so his handicap remained at 6.

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 128

Subminiature switches

Newly revised, this catalog on subminiature switches has just been issued showing handling of high electrical loads on both ac and dc circuits. In addition to the wide variety of basic switches, toggle assemblies, rotary selector switches and push-button assemblies, information on many new switches and assemblies has been added. Included are sealed environment-free subminiature switches and actuators, illuminated push-button assemblies, light force push-button switches, and a new series of sealed, multicircuit toggle switch assemblies. A total of 56 different switches, auxiliary actuators and switch assemblies are covered. *Micro Switch Div., Minneapolis Honeywell Regulator Co.*

For free copy circle No. 14 on postcard

Lathe attachment

A lathe attachment which combines pneumatic action with hydraulic control to secure high-speed semiautomatic production is described in a data sheet. Micrometer adjustment of the tool carriage provides close tolerance control and is claimed to hold zero taper on production runs. *Exact Level and Tool Manufacturing Co.*

For free copy circle No. 15 on postcard

Resin coated sand

A 16-page booklet has just been issued outlining various methods for coating sands with resins. Should be of interest to foundrymen, casting buyers, and product engineers interested in methods of producing sand coated with phenolic resins. *Durez Plastics Div., Hooker Electrochemical Co.*

For free copy circle No. 16 on postcard

Rolling mill

Illustrated catalog contains information on one firm's standard line for rolling ferrous and nonferrous metals in the form of sheets, strips, wire or rods. Included are two high and four high pinion drive; two and four high square gear drive; tandem mills; wire shaping mills; turks heads; and accessories. Also described is a Lab Rolling Mill for industrial and college metallurgical research laboratories. *Fenn Manufacturing Co.*

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Rotary gas carburizer

Description of rotary gas carburizing equipment is given in a new specification bulletin. In addition to carburizing, using either gas or compound as the medium, the bulletin says these machines are excellently adapted for hardening, annealing, or normalizing under a controlled atmosphere. It is constructed so desired atmosphere may be introduced through a connection provided for that purpose, preventing ingress of air or any other unwanted gas. Also contained is a table of operating data. *American Gas Furnace Co.*

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Water clarification

Removal of solids from waste water by settling is covered in a recently issued folder. It describes a self-contained packaged unit in a steel tank. Ease of installation and operation are featured. The process is said to handle the problem of plant water clarification, process water reclamation, valuable materials reclamation, or antipollution. *Chain Belt Co.*

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All-purpose coolant

Coolant containing no petroleum, mineral or vegetable oils is described in folder emphasizing increased production and worker safety. Completely soluble in water, it can be used in spray vapor systems. Examples of its wide usage and numerous advantages are listed. Among safety features are: no odor, non-toxic (will not burn, cause infection or dermatitis), harmless to clothes, does not cause slippery floors or "gum up" on ways or chucks and flows clean. *Vitene Mfg. Co.*

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Construction material

Scores of ideas on using slotted angle construction material are contained in this booklet. Best described as a large-scale erector set the booklet shows photographs of current commercial and industrial applications. Said to be versatile, strong and economical, it is applicable for a wide variety of plant maintenance and equipment needs. Accessories are shown including a special cutter, steel panels for shelving or stair treads and movable equipment casters. *Dexion Div., Acme Steel Co.*

For free copy circle No. 21 on postcard

Power take-off clutches

Publication of a bulletin on a line of friction power take-offs has been announced. It provides horsepower and torque capacities, side pull limitations, and dimensions for power take-off clutches. Included is information on firm's power take-offs, which are designed for high-speed, high-output industrial engines. Available in 95-602 hp models. *Twin Disc Clutch Co.*

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Company portrait

Entitled "This is Farrel-Birmingham," a new 44-page booklet gives a factual presentation of this company's ability to design and manufacture a wide variety of heavy machinery and machine tools in its four plants at Ansonia and Derby, Conn., and Buffalo and Rochester, New York. *Farrel - Birmingham, Inc.*

For free copy circle No. 23 on postcard

Lubrication guide

Lubrication guide covers lube systems and requirements of this firm's machinery. Equipment covered includes: bolt, nut, screw and rivet machinery; power presses; wire, rod and tube machinery and rolling mill machinery. The illustrated guide explains circulation oiling, centralized pressure lubrication, bath-splash oiling, centralized gravity feed and hydraulic systems. Text describing each system is accompanied by photos of typical machines employing the particular system. Booklet also covers lubricant physical properties and reasons for use; effects of temperature, water, acids and air on lubricants; influence of lubricant condition on machine performance and oil changing schedules as determined by speeds, loads, type of motion and other operating conditions. Information is given on pressure fittings, grease cups, oil cups, ring oiling and hand application of lubricants. A chart listing lubricants recommended by Socony Mobile Oil Co. is included. *Waterbury Farrel Foundry & Machine Co.*

For free copy circle No. 24 on postcard

Titanium bulletin

Containing titanium corrosion resistance data, a new bulletin suggests where this metal can be applied to overcome decay problems. Various titanium uses, based on corrosion resistance, are described. It shows how titanium has superior resistance to many of the most troublesome industrial chemicals, including nitric acid, wet chlorine chloride solutions, and sea water. *Mallory Sharon Titanium Corp.*

For free copy circle No. 25 on postcard

Fractional hp motors

Now available is a 12-page publication on fractional horsepower dc motors and equipment. Included are typical applications, product features, ratings and specifications for standard models. Also described are facilities, engineering, and application assistance available for the design and production of special models. *General Electric Co.*

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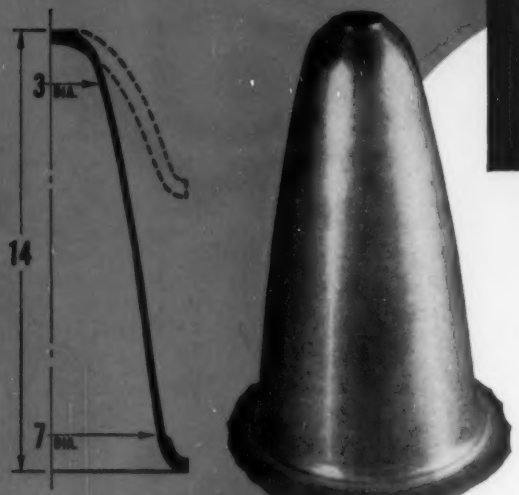
HEMISPHERES TO 38″ DIAMETER,

with ⅜″ max. wall thickness, are readily formed on the Cincinnati Hydrospin. Part wall can be tapered or have constant thickness. The starting blank is a flat disk or dished preform. Almost any ductile metal can be used. Other machines available for parts and hemispheres larger than 38″.



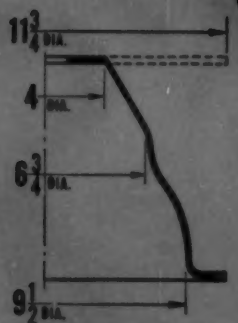
PARABOLIC-SHAPED PART

formed in one pass in two minutes. Starting blank of 61 SO aluminum, 11 ⅜″ dia. x 3/16″ thick, was preformed on a Cincinnati Hydroform.

complicated contours cost less by Hydrospinning!

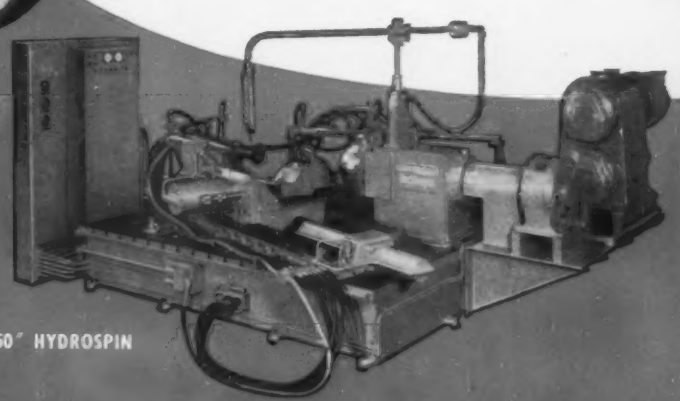
The parts shown here were formed by *tracer* Hydrospinning at substantial reduction in cost over that of previous production methods. These parts were produced in far less time . . . are more accurate . . . have increased strength with greater resistance to fatigue failure . . . required less material . . . and were made without compromising on material requirements.

If difficult-to-form contoured components are one of your production headaches, get the facts on Hydrospinning. Call in a Cincinnati Milling field engineer. For a detailed description of the process and machine specifications, write for new Bulletin M-1873-2.



COMPOUND CONTOURS

of this part were formed in one pass in one minute. Material is mild steel.



CINCINNATI 42″ x 50″ HYDROSPIN

CINCINNATI **Hydrospin**

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

HANDLING: New Diesel Engine

Now hauling passengers, new locomotive may be used for freight, inter-plant and mill hauling . . . Engine eliminates generators, complex wiring, electric motors now used.

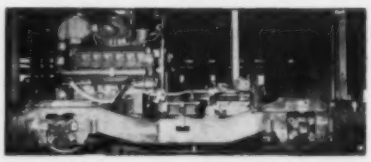
Elimination of large and presumably uneconomical generators on everything from small interplant engines to massive transcontinental freight haulers is being studied. Development of a new diesel, not diesel-electric, locomotive is being carefully watched by material handling engineers, large and small volume shippers, mill railroad operators, production men and curious onlookers.

Has German Transmission

The new locomotive has a compact German hydraulic transmission of simple construction. It's engine, unlike other so-called diesels which are actually diesel-electric, drives the wheels directly through the transmission and drive shaft. Other "diesels" drive generators producing electricity to run electric motors driving the wheels. Produced in this country by the Baldwin-Lima-Hamilton Corp., Eddystone, Pa., one locomotive is already in late experimental stages hauling a new "dream passenger train" on the New York Central RR. The system has been used successfully in Europe for over 15 years.

Pilot a Lightweight

Though the pilot model is a lightweight train, the makers see little difficulty in making larger models for freight or smaller ones for interplant carriers. Such an engine operating on an average steel mill railway would be just as efficient as conventional types while eliminating large electrical maintenance problems and complex repair jobs. Operation is simple, almost oversimplified, with the operator or engineer using only a two-speed shift lever (reverse, neutral, forward), an air-brake handle and a six step throttle. Automatic transmission handles gear shifting. Top gear commences at 65 mph on the N. Y. Central test model. It has a maximum speed of 120 mph.



Simple, compact new engine looks like any "V" type.

If the engine proves successful, production men believe it could mean gradual replacement of diesel-electric locomotives and haulers. Test models use less materials and both body and engine are small and compact. They are said to be ideal for newly developed lightweight trains. The builders are hoping for large orders and railroad operators believe lightweights will bring operating costs down which interests shippers.

If expected operating and maintenance cost cuts prove considerable, the new engine is expected to get quick acceptance by material handling men who can switch savings to other modes of transport.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 133. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

The Baldwin-Maybach engine is similar to conventional V type engines. However, it has a vertical turbocharger mounted in the V of the engine block and uses supercharger intercoolers. It has a noticeable shorter length. Cylinder bore is 7.3 in. and stroke 7.9 in. Normal operating speed is around 1550 rpm.

Weight Is Reduced

Transmission consists of a permanently filled hydraulic torque converter, a four-speed mechanical gear box composed of three pairs of helical gears operating in conjunction with positive overrunning claw clutches, and operating controls.

With wiring, generators, power transfer equipment and unnecessary parts removed that presently exist in diesel-electric engines, the locomotive is reduced from over 125 tons average to 87 tons. Engines are thus made lighter, shorter, lower and appear less fuel consuming.

Similar but different, 5-80 ton industrial torque-converter diesels have been produced by the Plymouth Locomotive Works, Plymouth, Ohio, for the past five years. The Budd Co., Phila., has been using similar drives on their self-propelled RDC passenger cars.

Foundry:

Large castings produced at new installation

Designed for quality production of large castings, a new foundry is now in operation at the Chambersburg Eng. Co., Chambersburg, Pa.

The plant, where over 80 pct of the tonnage is in castings larger than 10,000 lb, uses mechanical handling equipment for efficient space utilization and flow of materials.

All types of castings are produced in sizes ranging from 1000 lb to 150,000 lb, with 30 pct of the plant's production being made for outside customers.

The plant uses molding methods employing cement bonded

"Used material is crushed in a hammer mill . . .

sand for castings with closer tolerances and less shrinkage. Mold accuracy and strength of the cement bonding is described as providing better surface finishes and permitting practically all types of pit molding. Also stressed is the sand's high resistance to distortion under metal pressuring during pouring and solidification.

Operation Described

Work flow through the foundry is as follows: Incoming cement dropped from the hopper of a railroad car is elevated and discharged to a 600 barrel capacity storage tank. As cement is required in the foundry, a screw conveyor carries it from the storage tank to the weigh hopper at the mixer.

Tap and slag spouts are located for easy access.

The other basic material, sand, is received in railroad cars, dropped from the car to a pit and fed to an elevator. From the elevator, the sand is discharged on a movable belt conveyor to storage areas convenient to the mixer.

Floor, Pit Molding Available

With the cement bonded sand process, used molding material is reclaimable. The used material is crushed in a hammer mill or pulverizer to a grain fineness of 50 mesh; screened, and then cascaded in front of an exhaust outlet to remove most of the fines. In this way about 75 pct of the used sand is reclaimed for use.

Three for thrift!

Norton cut-off wheels... fast, safe and long lasting... bring you the profit-boosting "TOUCH of GOLD"

Norton has brought cut-off wheel development to the point where you can be sure of fast, clean cutting action, low rate of wear and a wide safety margin on every job.

That goes for all metals, from softest to hardest — for non-metals ranging from rubber hose to marble — and for any type of machine, high speed or low speed, swing frame, chopper, traverse, floor stand or portable.

Three of the most popular Norton cut-off wheels are shown here. See your Norton Distributor for practical help in wheel selection and facts on dry vs. wet methods for your cutting-off operations. Or write to the nearest District Office of NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone book, yellow pages. Behr-Manning Company, Troy, N. Y., division of Norton Company. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

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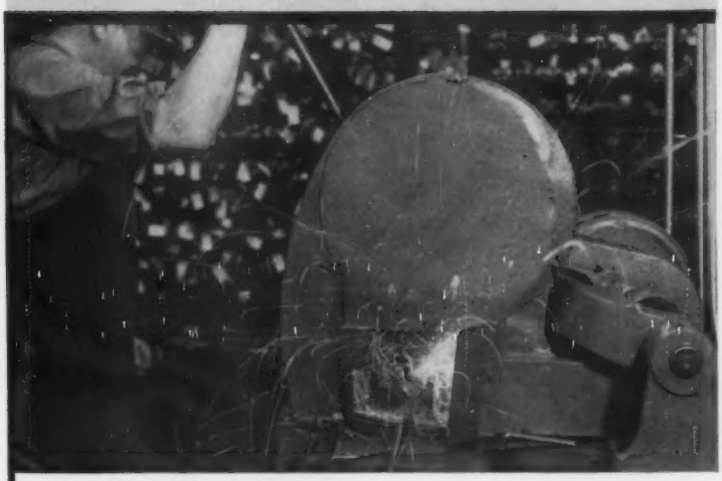

B9 RESINOID CUT-OFF WHEEL

The B9 is an ideal high production wheel, adaptable to speeds up to 16,000 sfpm. Available with either smooth sides, or with the rougher "F" sides for greater chip clearance. An exceptional performer on both ferrous and non-ferrous metals. For dry cutting only.

R50 RUBBER CUT-OFF WHEEL

Designed primarily for wet-cutting metal bar stock, the Norton R50 rubber bonded wheel handles diameters up to 6". Built-in chip clearance — unusual in this type of wheel — is an advantage for freer, cooler cutting with minimum burr and without case hardening the work. Can also be used for dry cutting.

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Making better products... to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels
Grinding Machines • Refractories
BEHR-MANNING PRODUCTS: Coated Abrasives
Sharpening Stones • Behr-Cat Tapes

BN RESINOID CUT-OFF WHEEL

Extra strength and safety, plus knurled sides for more effective cutting action, make the reinforced, resinoid bonded BN wheel a great favorite for the widest range of jobs, especially non-ferrous operations. Other uses include: cutting wire rope; slotting railway track welds; tuck pointing; cutting fibre board, concrete, tile, plastics, and the like.

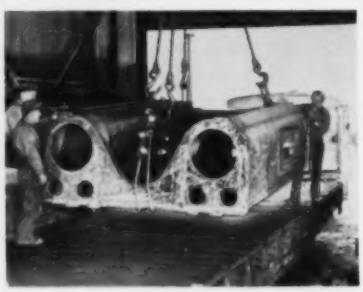
Both floor and pit molding are available in the foundry which includes two pits, each 120 ft long x 20 ft wide. Pits are separated and surrounded by concrete aprons permitting full use of electric trucks in delivering molding sand, cores and other materials.

With the techniques of using cement bonded sand there's a reduction in the need for rods and arbors since the full strength of the mold or core may be attained before being moved.

A rollover draw machine, sufficiently flexible to handle any mold or core up to 2000 lb, is used. In addition, a jolt machine, located just ahead of the rollover draw, serves to compact the cement bonded sand. A roller type conveyor eases handling of the flask throughout these operations.

Mechanical Charging Used

A mechanical cupola charging system is used at Chambersburg. It consists of an iron loading platform, a coke and stone hopper, a bucket transfer car and a monorail type cupola charger. The yard crane teams up with the charging unit in operations at the iron loading platform. All other functions are controlled by one man located in a pulpit convenient to the unit.



Rail and truck ramps are provided for loading castings.

Gray iron and alloy irons, including ductile iron, are poured at the foundry. A single cupola, having a melting capacity of 40,000 lb per hr, is used.

The cupola installation includes specially engineered bottom drop doors which open to the outside when pouring is completed. With

this technique, cooling and reclaiming of usable material from the charge can be carried on without interruption to the functions inside the foundry building.

Castings, after pouring and cooling, are removed to the large chipping floor. Here, due to the large variety and sizes and shape of work, manual chipping operations are employed. A 400 lb general utility hammer is located near the cleaning area and is used for sharpening chipping tools. The hammer is connected directly to the shop air line.

Interior rail and truck ramps are located adjacent to the chipping floor for loading out the castings.

Painting:

Industry tops humorists; speckled paint is real

Many an apprentice painter has discovered the hard way that there isn't any such thing as polka-dot or speckled paint. Now industry has removed this bit of hazing by actually producing it. The startling new coating dries in a variety of two-color speckled patterns in any shades desired, and may be brushed, sprayed, or rolled on.

Minute particles floating in the paint give the speckled effect. These particles have large "heads," and smaller "tails." The heads are composed mainly of aluminum pigment—the tails of resins and solvents. By a newly-developed process, the heads of these particles are made non-polar, which means they repel each other. The tails, on the other hand, attract other tails.

Unlike Anything Before

The man who developed the new product, and who is putting it into production, is Walter Lox, director of new products research for Forman-Ford and Company, Minneapolis. He admits it sounds unbelievable but emphasizes "it works, and gives a beautiful speckled effect, unlike anything ever before produced by a paint."

Reynolds Metals Company, Louisville, supplied the non-leafing aluminum pigment.

It comes in two cans—one is a base coat, and one the finish coat. Size of the speckles is varied by the time the base coat is allowed to dry. It will be available in glossy or semi-gloss and is said to have very good weathering characteristics. Price will compare to most good enamels.

Lox predicts that the new coating will be widely used in industry, for finishing such products as appliances, implements, even, perhaps, automobiles.

Manufacturing:

Multiple parts are cast in single operation

Simultaneous casting of 14 die-cast, zinc-plated, spring steel parts is being successfully used by a Chicago manufacturing firm. A single trim die trims them in another operation, obviously eliminating additional operations.

Presently used in the manufacturing of power garden tools at the W. R. Brown Co., it is said

All 14 power hoe parts produced in a single casting operation.

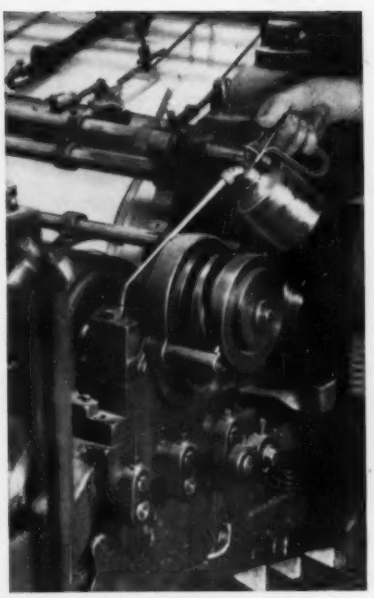
that the method is simple and practical enough to be adopted to virtually any industry using castings.

The only machining steps required are drilling four No. 6-32 holes in the gear head castings and an 11/16 in. hole in the saddle bracket for the drive shaft tube. Holes are tapped for assembling the saddle bracket to the drive shaft tube, handle and drill brackets.

Seven Products Replace Twelve. Sun representatives show how Sun's plan of industrial lubrication and preventive maintenance benefit management.

Over 70% of all plant equipment is now lubricated by only two moderately priced oils.

How A Sun Engineer Helped Cut Lubrication Costs by 15%... Reduce Oil Inventory by 42%



Maintenance Is Easier. Sun's plan helps prevent mistakes... reduces chances of applying wrong lubricant.

For years, department foremen of a large folding box plant purchased "special" lubricants to meet individual needs. Throughout the plant, a total of twelve products were being used...some extremely high in price.

The man from Sun called management's attention to this fact. He pointed out that much of the plant equipment, although different in name and function, was mechanically the same. He proved that over 70% of the equipment could be lubricated by two products instead of several lubricants basically alike.

Today, as a result of Sun's recommendations, "special" lubricants are gone; costs of lubrication are down 15%; and, oil inventories are reduced by 42%.

For the full story about how Sun can simplify lubrication setups and save on oil costs...see your Sun representative or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. IA-6.

SUNOCO®

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

PHILADELPHIA 3, PA.

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Die-cast parts consist of a two-part gear head, 2 oil seals, 2 hexagonal drivers with attachment keys, 4 blade spacers, 2 outer washers, a saddle bracket and a drive shaft coupling. The drive shaft tube is welded steel tubing, zinc plated; the hoe blades are zinc-plated spring steel.

Casting design problems required careful consideration of cores and drafts that would need machining. Simple to cast parts that required a minimum of machining were emphasized.

Compensating for shrinkage, the designer was able to hold dimensions to within 0.001 and dispense with drilling. Only secondary operation needed was a single ream to remove necessary draft, and the tapping of the threaded holes.

Metal Finish:

Use of pre-plated metals gaining wide acclaim

Faced with constantly improving product appearance and design, many manufacturers are turning to pre-plated metals. Their importance as a versatile design material for consumer and business goods is increasing.

Pre-plating skips several steps giving finished raw material.

Some typical examples: splash backs, oven liners and lamp housings for stoves; light reflectors on bathroom cabinets; outer shells for toasters and fryers; reflector panels for space heaters; escutch-

eon plates and other door hardware; canister sets and other housewares.

Finished Raw Material

Because they are a "finished" raw material, pre-plated metals need no cleaning, plating and buffing ordinarily required to produce a plated part. Instead, they may be immediately fabricated and assembled into the finished product. In the pre-design stage, too, they offer a great freedom of design. Manufacturers claim they open new techniques for design engineer.

They are readily adaptable to standard production techniques, according to one maker, the American Nickeloid Co., Peru, Ill. Sheets, coils or strips; base metals of steel, zinc, copper, brass or aluminum with finishes of chrome, nickel, copper or brass are being produced. Where severe forming is required metals sometimes contain strippable plastic film or adhesive-backed paper which is easily removed after forming.

Tooling:

Heavy die and plate float on air

With a combined weight of 1000 lb, a transfer plate and a heavy die float like a feather on a thin cushion of air with a new development.

Only five lb pressure is needed to move this plate and die.

Six evenly spaced ⅛ in. holes inject compressed air at 100 lb per sq in. pressure against a hydro-

press table in the heavy press department of Northrop Aircraft, Inc. This lifts the heavy tooling plate and die. Operators then move the die under the press with ease.

Only five lb pressure is necessary to move plate and die when air is turned on. Five men would be required to move the apparatus without use of the pneumatic device.

Problem Solved

Engineers were confronted with a problem of placing rollers under the heavy press dies or devising some other means of positioning the tooling. Rollers would have to be removed before the press could be operated. A 1/5 scale model was built as a test. It lifted 1500 pounds with ease.

Flanges on the side of the magnesium tooling plate keep the plate in alignment with the press table.

Company engineers point out that accurate positioning under the press is achieved by installing automatic shut-off air supply cams which can be adjusted to stop the travel of the tooling plate at any point.

Metals:

Monel lightning rods resist stack gas

When lightning strikes, it is the generally accepted belief that adequate protection of industrial stacks depends upon clean, uncorroded, conductive lightning rods. One rod producer believes ordinary lead-coated copper rods are inadequate on the heavy duty stacks of power, coke and gas plants and incinerators. That company, the Carl Bajohr Co., St. Louis, now installs rods with terminal sections made of Monel nickel-copper alloy.

It's not the weather, but the combination of heat and corrosion from stack gases that does the damage to the lead-coated upper rods. Under normal conditions, this has been overcome by a lead covering on the upper 25 ft of a copper conducting system.

High temperatures of some in-

dustrial stacks melt off the lead covering and exposes the copper. These rods are then attacked by corrosive gases.

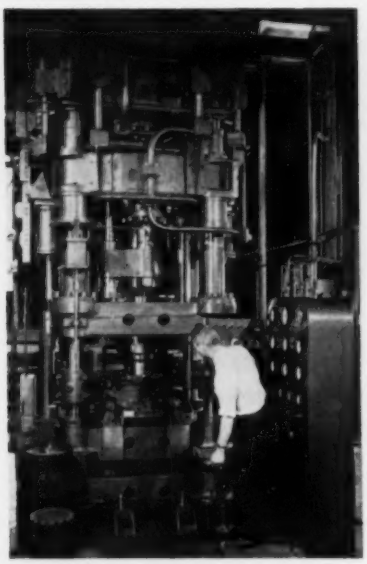
In especially severe cases, rods are installed with the air terminal or top section made of the nickel-copper alloy. This alloy not only has increased strength and adequate electrical properties for lightning rod applications, but needs no coating; it is corrosion-resistant all the way through.

Bajohr also uses alloy on bolts, screws and hardware used to fasten conductors.

Forming:

Largest press compacts metal powder parts

First of its kind, a new 300 ton hydraulic press is now in production at The United States Graphite Co., division of The Wickes Corp., of Saginaw, Michigan. The company says that it is the first of its size ever used to compact parts from metal powders. The giant press, which weighs 50 tons, is fully automatic and possesses multiple action features. It was designed and built by Baldwin-Lima-Hamilton.



Hydraulic press makes compact parts from metal powders.

In addition to increasing the company's production capacity for sintered metal parts, the new 300-ton press will produce much larger parts on a production basis than was previously possible.

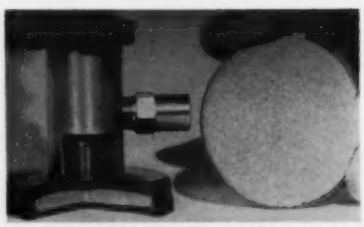
The machine's multiple action will permit the pressing of parts having a difficult "H" shape cross-section or other unusual design details. Company officials believe the huge press will be adopted to wider applications.

Lubrication:

Centralized lube systems will take temperatures to 500° F.

Centralized lubricating systems designed to withstand temperatures up to 500°F while providing fully automatic lubrication have been announced.

The systems use newly designed valves and filters that combine heat-resistant qualities with desired filter and flow control characteristics, the maker, Bijur Lubricating Corp., reports. Bijur also worked with several major oil suppliers who developed special lubricants to be used in conjunction with the new systems.



Sintered bronze filter fits inside the pump as shown at left.

Applications Cited

High temperature lubrication equipment has been successfully installed on different types of machinery operating under temperatures ranging from 200-500°F, such as hot cut flare machines for the glass industry, flatwork ironers in commercial laundries, and valve stems of large industrial gas engines.

New Books:

"The Machinist Dictionary," by Fred H. Colvin, is described as a "handbook of terms, definitions and accepted standards of the machinist craft and industry." It was compiled, the publishers state, to present information concerning machine terms, parts and standards in a comprehensive form for quick and ready reference. Terms are listed and defined in alphabetical order. Tables, charts, lists and illustrations are used to clarify and extend the information in the text. Simmons-Broadman Publishing Co., 30 Church St., New York 7. $7.50. 496 p.

"Spot and Seam Welding of Titanium and Titanium Alloys," is a handbook prepared for the Navy Bureau of Aeronautics. According to this research report, the welding processes may be readily applied to production grades of commercially pure titanium sheet, the oxygen-nitrogen titanium-base alloy Ti-100A and 8 pct manganese titanium-base alloy. $4.75. 189 p. This publication, PB 111707, Final Report, North American Aviation, Inc., for Navy Bureau of Aeronautics, may be ordered from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25.

"The Engineering Properties of Commercial Titanium Alloys," by M. W. Mote, Jr., and P. D. Frost. Presents the known reliable mechanical and physical properties of the titanium alloys with recognized commercial significance. Fifteen alloys are discussed in detail. The report includes sections on the general composition and designation of alloys which have been made in commercial ingot size; the properties of these alloys in the annealed condition; the properties of the alloys in the heat-treated conditions; a review of the data on uniformity of alloys; and discussion of the data. $2.25. 90 p. Order as Publication PB 111981 from Office of Technical Services, U. S. Dept. of Commerce, Washington 25.

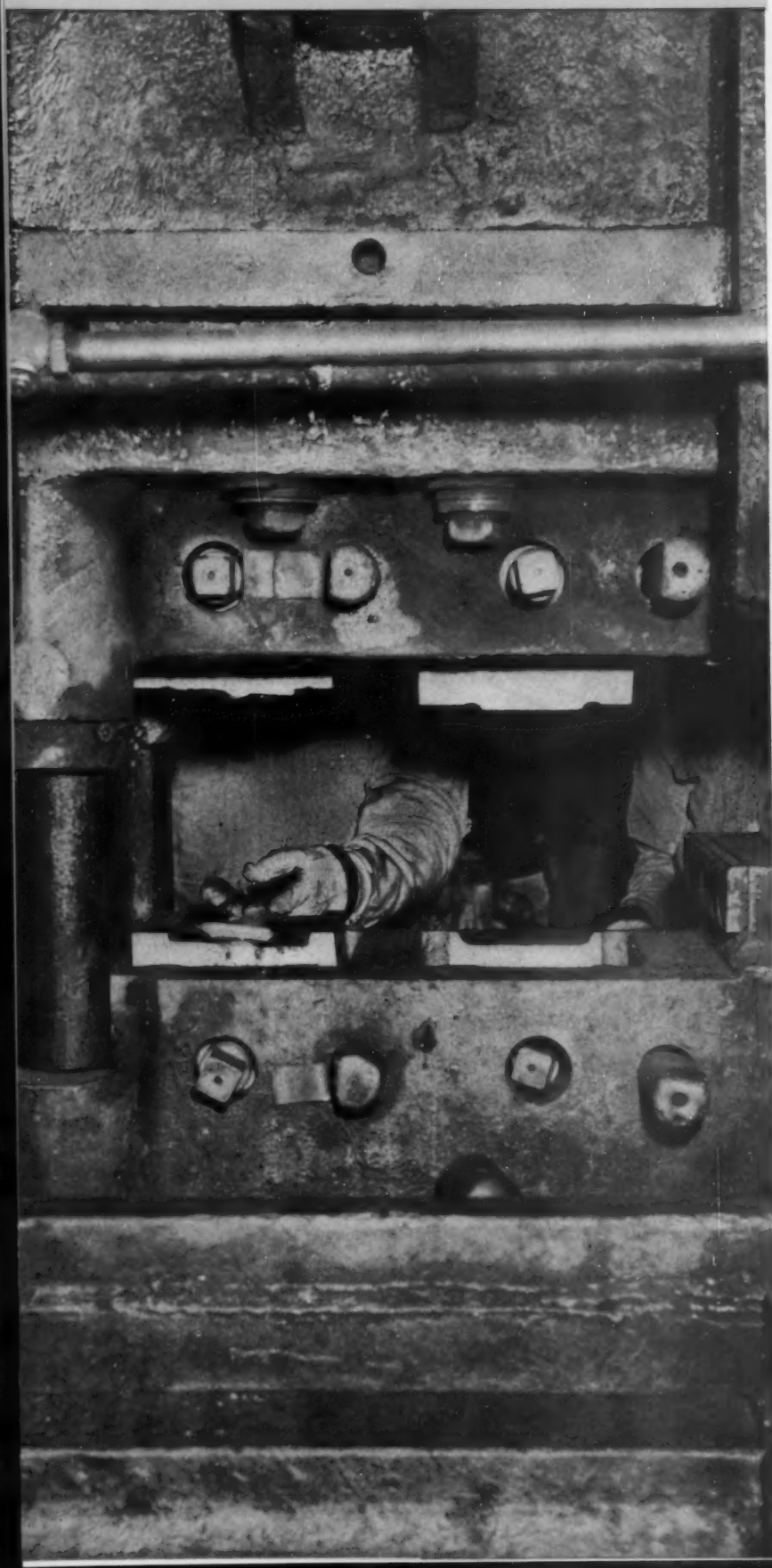
TECHNICAL BRIEFS

"Standards and Dimensions For Taps and Dies," was prepared by the Tap and Die Div., Metal Cutting Tool Institute. Contains the 1955 revision of tap standards as outlined in detail with accompanying conversion tables and tables of tap recommendations for classes of thread 2, 3, 2B, and 3B. The importance of drilled holes for tapping has been recognized and the minor diameter of tapped holes discussed with the inclusion of a chart of tap drill sizes. The complete commercial standards as adopted by the Tap and Die Division (M.C.T.I.) are also included. Metal Cutting Tool Institute, 3114 Chrysler Bldg., 405 Lexington Ave., New York 17. $1.25. 80 p.

"Electronic Data Processing For Business and Industry," written by Richard G. Canning has been designed to answer such questions as "What is electronic data processing?" and "What can it do for a company?" It begins with the period when management is considering such equipment and follows through to a conference table presentation of a plan of action. Couched in the phraseology of management, the book was still prepared with attention to the technical accuracy of the engineering points. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $7.00. 332 p.

ASTM Standards—Ferrous Metals and Nonferrous. Parts I and II of the 1955 edition of the American Society For Testing Materials publication of standard specifications, tests and definitions. Part I on ferrous metals covers the steels, both carbon and alloy; irons; ferro-alloys; and numerous tests. It includes 1834 pages and 315 standards, 211 of which are new or revised since 1952. Part II covers the coppers, leads, aluminum and magnesium, metal powders and widely used test precedures. It includes 1516 pages with 270 standards, 156 new or revised since 1952. Part I is $13.50 and Part II is $11.00. American Society for Testing Materials Headquarters, 1916 Race St., Philadelphia 3.

'dag' dispersions . . . *a touch does so much!*



Colloidal Graphite saves $25,000 a year on jet-blade forging

In the close-limit forging of a jet-turbine blade, a prominent manufacturer found that by using **'dag'** Colloidal Graphite on the dies, only one blow was needed to go from upset billet to final blade shape. Besides eliminating the second hammer-blow previously required, intermediate descaling and reheating operations were also avoided . . . for a total yearly saving of some $25,000 on this single operation.

Both oil-based and water-based **'dag'** Colloidal Graphite dispersions are widely used in forging operations. Diluted and sprayed on the dies, the colloidal graphite forms a slick lubricating film . . . protects the expensive dies and improves metal flow during forging.

Pretreatment of new dies with **'Aquadag'** — colloidal graphite dispersed in water — has paid off handsomely, too. Some firms estimate a 50% greater usable life from forging dies given this protective film of colloidal graphite before being put into service.

The benefits of **'dag'** dispersions for forging and other metalworking applications are discussed in Bulletin 426. Ask for your free copy.

100th Anniversary

1891—SILICON CARBIDE
1895—SYNTHETIC GRAPHITE
1906—COLLOIDAL GRAPHITE

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Yes, I want your free bulletin describing 'dag' Dispersions for Metalworking.

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Company_____

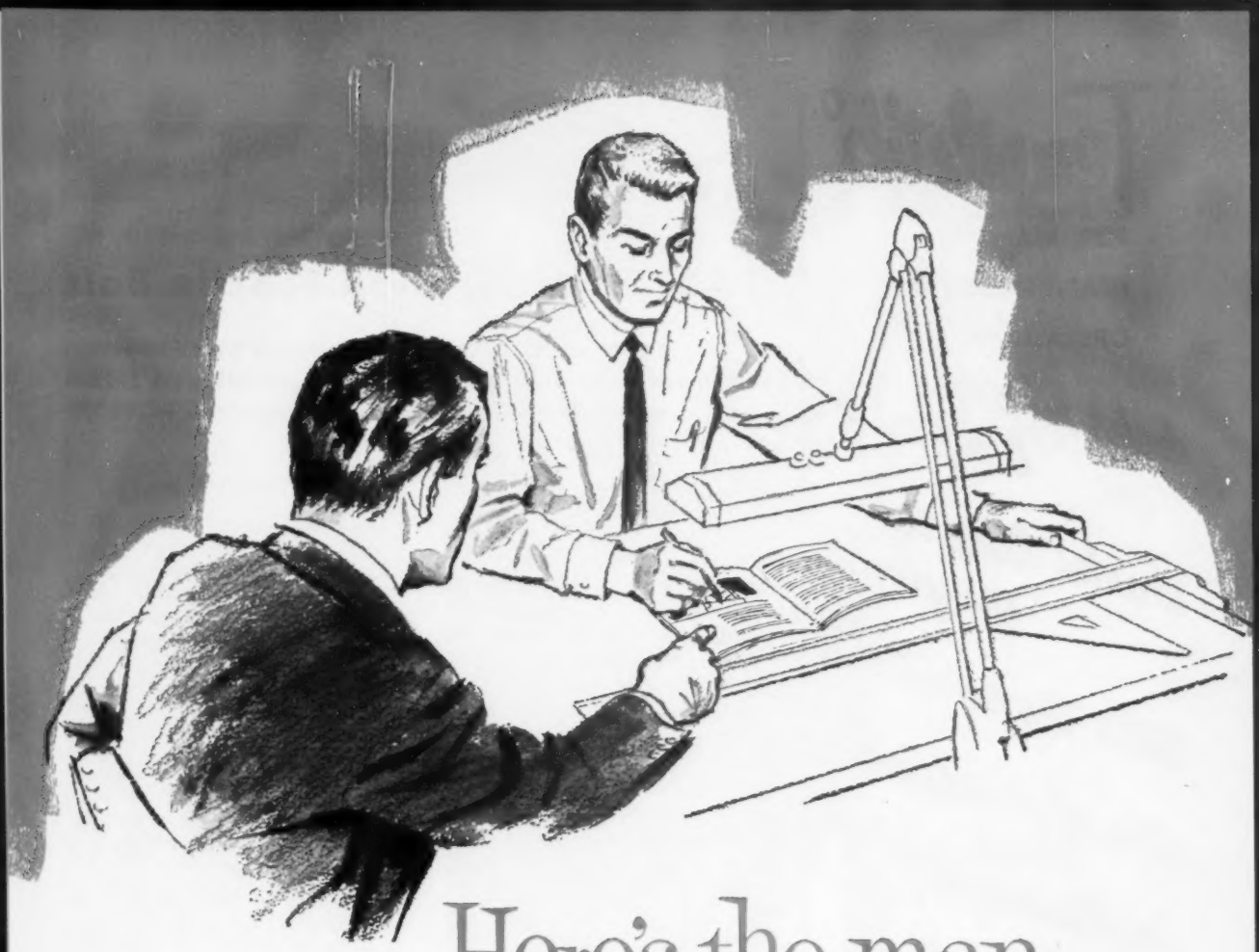
Address_____

City_____ State_____

"High-Speed Combustion Engines," by P. M. Heldt is the new, revised 16th edition of this automotive engineering work on combustion engines. Because of the increasing use of liquefied petroleum gases as motor fuels, information on the properties of these fuels has been added, and descriptions on the apparatus used to store them on the vehicle and to prepare the combustible mixture are given. The chapter on Engine Tests has been enlarged, and a new chapter has been included on the Thermodynamics of the Combustion Engine. Chilton Co., Book Div., Chestnut and 56th Sts., Phila. 39. $12.00. 805 p.

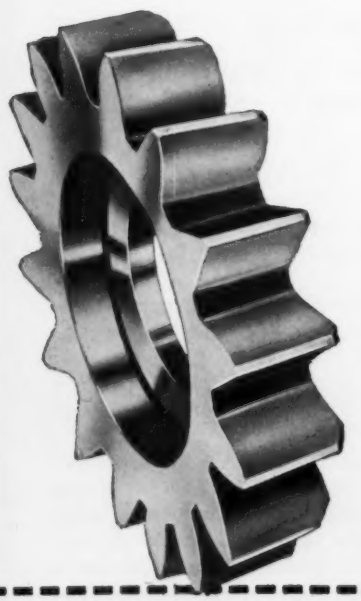
"Custom House Guide, 1956 Edition," published by John F. Budd is one of the oldest and most recognized foreign trade encyclopedias in the world (94th yr.). With 1,688 pages and a listing of 20,000 commodities indexed, it provides as up-to-date U.S. duty rates as can be found. It is updated to all Acts of Congress, trade agreements and GATT (General Agreement on Tariffs and Trade). Lists approximate customs rate of duty, tariff paragraph, classification number and description on all 20,000 items. Gives all customs regulations, administrative provisions of the Tariff Act (1930) revised to date, Internal Revenue Code additions and revisions, Reciprocal Trade Agreements and much more. All ports are covered. Seems like a must for overseas shippers. $25 plus postage. Custom House Guide, Box 7, Station P, Custom House, N.Y. 4.

"AWS Bridge Specifications, Fifth Edition," by the American Welding Society gives data for welded highway and railway bridges. Extensive revision of the Fourth Edition was necessary due to increasing use of welding for new bridge construction, strengthening, and repair work. One important addition is provision for use of steel especially suitable for welded bridges. $1.50. American Welding Society, 33 W. 39th Street, N. Y. 18.



Here's the man

who takes the problems out of gear shaper cutter buying



He's backed by the facilities and experience of 44 years of metal-cutting tool development.

Your Illinois Tool Works sales engineer can help you specify the best possible shaper cutters for your individual requirements. He offers the extensive facilities of Illinois Tool Works for the design and production of efficient gear tooling, and through years of personal experience, he can suggest the most effective use of all gear generating equipment. Have this man come in to talk about precision shaper cutters made to your needs. You'll find his advice helpful.

"Know Your Gear Shaper Cutters"

Send for this valuable booklet today! It contains information on how tooling costs per gear can be reduced—efficiency improved. Write for your copy, now!

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Look to your Illinite Distributor for the most complete line of standard end mills, standard milling cutters and special cutters.

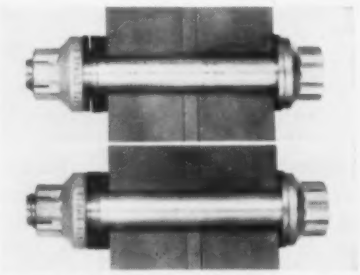
FASTENINGS: High Tensile Bolt

With new thread design that departs from convention, new thread design steel bolts have tensile strength from 220,000 to 240,000 lb psi . . . Maker hopes to boost this to 300,000.

High-tensile and high-fatigue strength are put into a new bolt that is described as "the wonder metal of the age," a "super bolt," and which produces "results at odds with accepted metallurgical fact."

With "a new thread design that departs from conventional practice," the fastener has a root radius 30 pct larger than that on standard fasteners. This blunts the sharpness of the natural notches in the threaded section and reduces the stress concentrations. New processing techniques for producing the bolts was developed by Standard Pressed Steel Co., Jenkintown, Pa.

The new bolt is said to have tensile strengths from 220,000 to 240,000 lb psi. This is the highest attained in a practical threaded fastener; almost 40 pct greater than that of the best standard aircraft bolts. Fasteners are expected to be used considerably in the aircraft, machinery and equipment industries.



New bolt (top) is tightened to 240,000 lb. psi. (below).

Even further development of these methods is being predicted with bolts possessing "undreamed of holding power." This is described as being above 300,000 lb psi.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 133. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Bolts have minimum shear strength of 130,000 psi compared to 95,000 psi for standard bolts. One 1½ in. diam bolt of the new type could support the weight of a 350,000 lb bomber.

According to the company, the new bolts violate a hitherto accepted fact of line in metallurgy that the higher the tensile strength of a steel fastener the more brittle it becomes. Despite extreme static tensile strength, the company says, they actually have up to 78 pct greater fatigue strength. Bolts are made of steel which the company refers to as the new "wonder metal."

Testing:

New X-ray film is faster keeps old sensitivity

Industrial radiographers are given new versatility in working with all types of X-ray machines and gamma ray sources with a new fast-exposure industrial X-ray film.

Tabbed Type AA by its makers, the Eastman Kodak Co., it retains the fine sensitivity of the older, widely used Type A film while offering greatly reduced exposure needs. Film speed ranges from approximately 1.3 to over twice

that of the conventional Type A.

This enables X-ray technicians to: (1) Reduce exposure time. (2) Provide increased radiographic sensitivity through higher densities with established exposure and processing technics. (3) Give greater subject contrast, more detail and easier readability by using

New X-ray film sensitive as any and is 1.3 to twice as fast.

established exposure times with reduced kilovoltages. (4) Shorten the processing cycle with existing exposure technics. (5) Reduce the possibility of pressure desenitization under shop conditions of use.

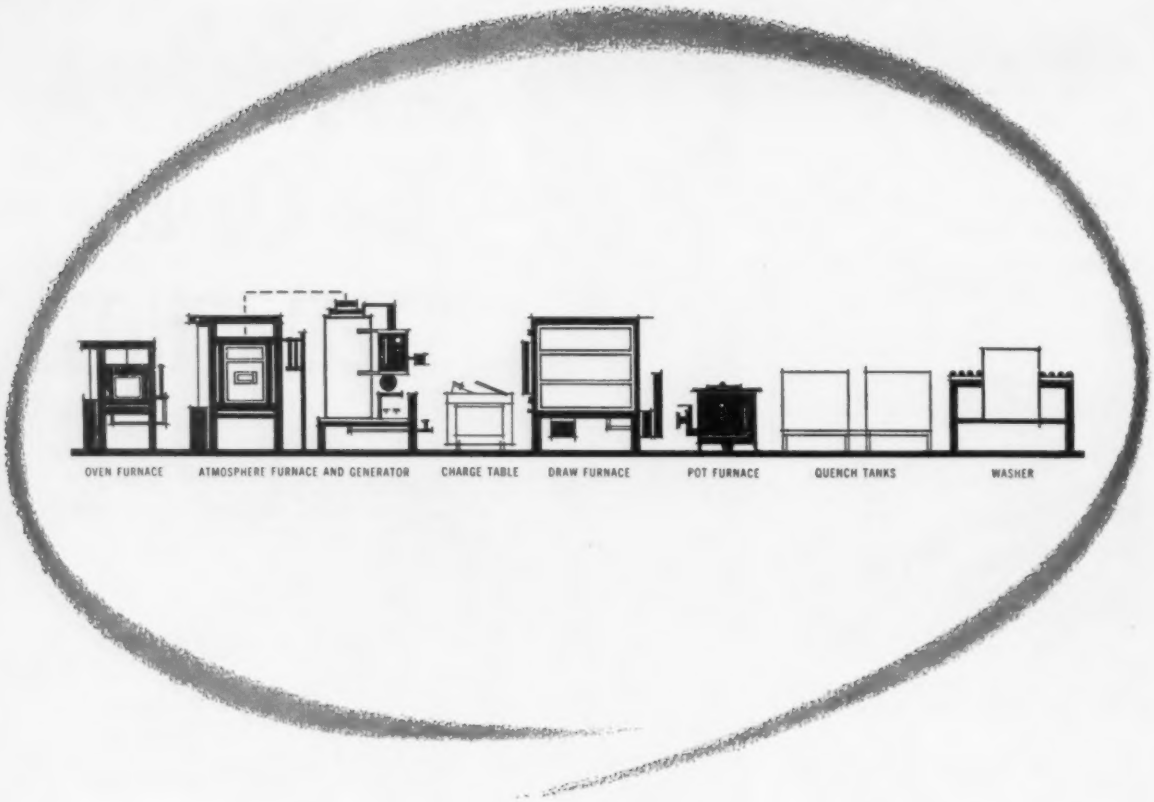
Type AA is available from all Kodak X-ray dealers.

Coating:

Corrosion-resistant coat may be sprayed on

Film thicknesses of 50 to 60 mils per spray coat, triple the thickness previously possible, is done with a newly formulated sprayable plastisol, according to its developers.

Known as "Unichrome Super 5300," the new coating makes possible gun application of the full solids content of vinyl plastisol without a diluent, the Electroplating and Coatings Div., Metal & Thermit Corp. reports. Pore-free 50 to 60 mil coat can be successfully applied in one layer which gives "sheet" protection to tanks, ducts and other large equipment, it is claimed. Because it is sprayed



one package: many advantages

buy a complete heat treat facility from a single source—as you can from Surface Combustion—and you save both time and trouble.

in one neat package, you get furnaces*, atmosphere generators, quench tanks, and washers. The individual units are matched in capacity for operating efficiency—and here's how you save:

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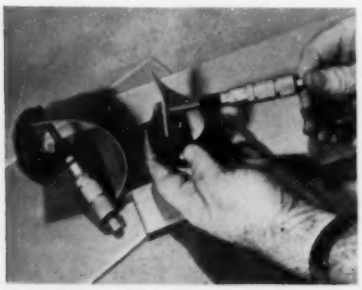
HEAT TREATING EQUIPMENT

on, there are no seams or joints where corrosives might penetrate.

First production line spray plastisol which permitted 20-mil thick films per spray coat was introduced a year ago by the company. The sprayable plastisol greatly extends finish usefulness because of increased thickness obtainable.

It is a compound based on vinyl resins and is resistant to the corrosive action of strong acids and



Vinyl plastisol can be sprayed to coat thickness of 60 mils.

other corrosive materials. Satiny smooth in appearance, the material forms a tough, flexible film which absorbs impact without chipping, withstands abrasion and has acoustical and electrical insulating properties, according to company engineers. Field evaluation reports indicate that the new plastisol coating permits the substitution of ordinary metals for costly alloys.

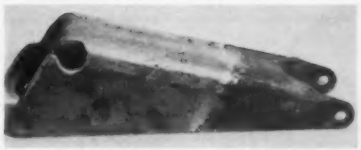
Corrosion:

Powdered alkaline compound removes rust in minute

Rust, paint and primer are removed in one operation with a new alkaline material. It's powdered and is said to eliminate four of the six steps required for conventional removal methods.

Said to remove light rust in less than a minute, it is produced by Turco Products, Inc., Los Angeles. Heavy rust and multiple paint layers usually require only a few minutes immersion. Red oxide primer, baked lacquer, asphalt and acid-proof paint are also removable.

It contains no cyanide com-



Rust virtually disappears from left after alkaline treatment.

pounds and requires no complicated electrolytic equipment. It does not emit corrosive fumes and eliminates hazards commonly encountered when acid tanks are charged. It will not affect dimensional tolerances or cause hydrogen embrittlement, the maker says. After-neutralization is made unnecessary with only just a pressure rinse needed.

Unlike de-rusting with acid, metals treated with this compound are said to be no more subject to rusting than is new metal.

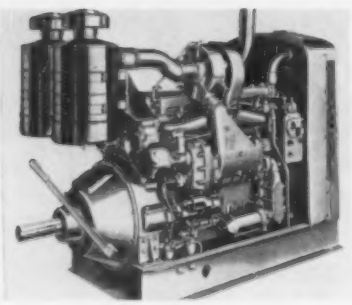
NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 133 or 134.

Flexopress is accurate to within 0.0005 in.

Accuracy within 0.0005 in. and parallelism between slide face and bed within 0.0015 in. is made possible by the unique anti-friction ball-bearing raceway construction of the new 75-ton automatic Flexopress. The slide, with four preloaded raceways operating in hardened and ground inserts, maintains a very high degree of vertical accuracy. Thus preventing misalignment between punch and die. High speed operation up to 370 strokes per minute is possible due to low ram inertia. Contributing to this is lightweight aluminum alloy ram construction, the anti-friction bearings plus double air cylinder counterbalance. It accommodates work up to 14 in. wide with a 15 in. side opening. Machine has air friction clutch mounted integral with the crankshaft, air-opened and spring-closed brake. *Precision Welder & Flexopress Corp.*

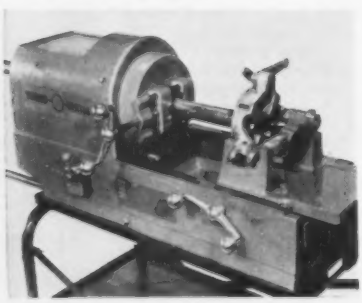
For more data circle No. 27 on postcard, p. 133



Trio of latest diesel engines is unveiled by GM

Major diesel engine manufacturer has unveiled three new ones as additions to its series of industrial two-cycle diesels. All past features plus the addition of a single-shaft, exhaust-driven turbine and an air-impeller are included. New engines promise greater fuel economy. Four and six cylinder units develop 171 hp at 2300 rpm and 236 hp at 2100 rpm respectively. They are relatively compact in size, weighing only 9½ lb per hp. Increased hp is attained without fuel increase through an exhaust-driven turbine and air impeller. Engine driven blower increases air pressure. *Detroit Diesel Engine Div., General Motors Corp.*

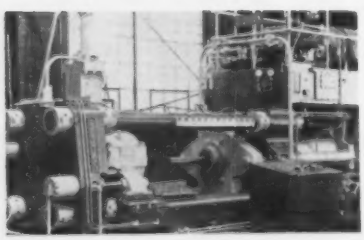
For more data circle No. 28 on postcard, p. 133



Bolt threader has power operated double chuck

This portable pipe, conduit and bolt threader has a power-operated double chuck. It offers record-breaking speed in threading and cutting pipe or conduit from ⅛ to 2 in. and bolts from ¼ to 1½ in., according to the maker. Among its many advertised advantages are: (1) A sliding extension bar making it easy to break tight fittings, (2) Pipe is guided into the spindle by the funnel-shaped design of the rear cover, (3) The tool tray on top of the housing offers greater working convenience and efficiency, and (4) The spindle bearings are lubricated by continual feed of oil from individual reservoirs. *Collins Machinery Corp.*

For more data circle No. 29 on postcard, p. 133



Extrusion press features hydraulic controls

Featuring an electro-hydraulic control system, a new 1250/1500-ton extrusion press was unveiled to the aluminum industry. Utilization of the control, developed by Oilgear and Raytheon, makes possible high-speed extrusion of 24 in. long aluminum billets of 5-6 in. in diam. These are done at a rate of over 50 per hour. Operator has choice of manual or automatic control. Operator can vary speed any time during cycle. *Sutton Engineering Co.*

For more data circle No. 30 on postcard, p. 133

Small parts bottlenecks strangling your milling department

?

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Wide range of speeds handles any material. Dependable performance and ease of set-up lower operational costs on all types of small parts. Vertical Milling Attachment and complete range of other accessories available.

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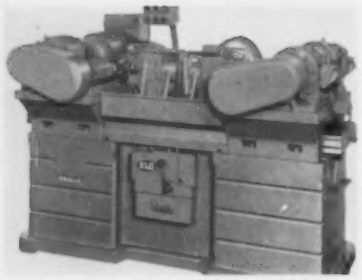
Unsafe hazards eliminated on deep-throat press

Stored energy and double-tripping hazards are eliminated with a new 15-ton deep-throat punch press. The machine has no flywheel or mechanical clutching. This cuts down noise, vibration and accidents, the maker says. Stroke results from an electrical surge which starts the motor from a dead stop. Motor goes dead again at the end of the stroke cycle. Two single-trip buttons are widely spaced to keep operator's hands clear of danger zone. He must push both buttons at once and hold them until stroke reaches bottom. Releasing starts new cycle. A heavy-duty safety brake applies whatever power is disrupted or disconnected. A safety stop button halts the press instantaneously at any point in the cycle. Any mechanical or electrical failure will fail safe, according to the manufacturer. Controls permit operator to change from single to continuous stroke. Resetting a cam quickly changes timing. Single stroke speeds: 60 per minute; continuous: 190 spm. *Kenco Mfg. Co.*

For more data circle No. 31 on postcard, p. 133



Precision borer doubles production

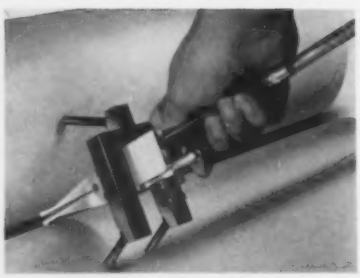
With spindles continuously running, a standard double-end precision boring machine is attaining double the old production rate milling steel propeller shaft pinion flange. Machining operations consist of facing and undercutting with milling cutters, at two places on each part. Machine is company's basic precision boring machine with extra-wide bridges for transverse mounting of the spindles. It can be automatic or manually-controlled One part is loaded as a second part is being machined, resulting in a net production rate of 188 parts per hr. Safety device halts operation if improperly clamped or fed. *Ex-Cell-O Corp.*

For more data circle No. 32 on postcard, p. 133

Blowpipe cuts everything from sheet to slabs

Capable of cutting light-gauge sheet to 8-inch slabs, a new blowpipe has been unveiled. It is designed for light-to-medium mechanized cutting with a portable machine carriage, but it can be used with any machine carriage equipped with suitable blowpipe rigging. It operates on medium-pressure acetylene or other fuel gases, and is intended for continuous or intermittent straight-line, bevel, and circle-cutting operations. *Linde Air Products Co., Div. of Union Carbide and Carbon Corp.*

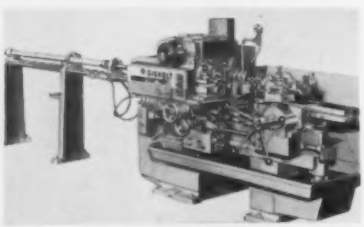
For more data circle No. 33 on postcard, p. 133



Air-caliper gage provides direct measuring

An air-caliper gage that provides direct measuring for spacing between cylinder rolls so that the user may determine whether the rolls have been ground correctly is being offered. When calendering sheet plastic or similar material, uneven calendar rolls produce uneven sheets. This can be seen immediately when the material is packaged in rolls because even very small imperfections, multipled by the roll's layers, become intolerable. This gage checks that spacing accurately and without difficulty, according to the manufacturer. *Federal Products Corp.*

For more data circle No. 34 on postcard, p. 133



Three model Universal turret lathes available

New throughout, this company's universal turret lathes are available in three basic models. They provide faster, easier operation with increased spindle speeds than earlier models. No. 3 lathe has a 1½ in. round bar stock capacity; No. 4, 2 in. capacity; No. 5, either 2½ normal or 4½ in. (through spindle). All can be equipped with mounting on rear of cross slide. Can also use hydraulic drive unit. *Gisholt Machine Co.*

For more data circle No. 35 on postcard, p. 133

24

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CONTINUOUS GALVANIZING LINES

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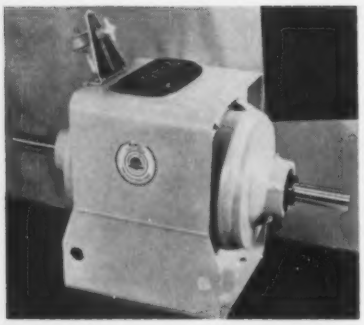


Adjustable speed fluid drive has lower hp

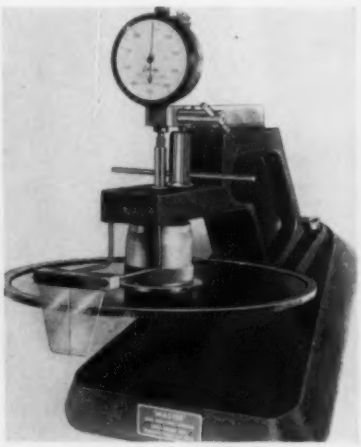
Aiming at the lower horsepower users in the machine tool, fabricating and production machinery industries, one firm has developed a new series of Class 2 adjustable speed fluid drives for 1 through 25 hp applications. The units are suited for automated installations where automatic speed adjustment, and uniform accuracy of repeat speed settings are needed.

Speed fluid drives are adjustable. Units protect drive motors and driven machinery from shock loads, torsional vibration and excessive torque. Can be used with single-speed motor to provide adjustable, stepless speed control. *American Blower Corp.*

For more data circle No. 36 on postcard, p. 133

Indicator checker

Described as quick, easy-to-use and completely dependable, this method of checking the accuracy of all A.G.D. indicators is now available. This instrument is set to replace the gage block method of checking, its makers believe. It enables users



of dial indicators to check new, incoming indicators for stated accuracy. The d'al indicator is checked against a large calibrated wheel, 8 in. in diam with a micrometer barrel at its hub. Graduations of 0.0001 in. are marked on the wheel's outer rim and may be lined up with a hairline sight. *Petz-Emery, Inc.*

For more data circle No. 37 on postcard, p. 133

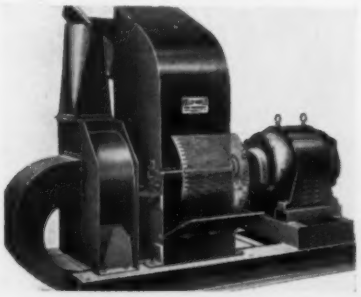
Carbide dowel pin reamers

Designed specifically for reaming operations in die hardened Rc 45-65 steel, this new carbide dowel pin reamer is said to eliminate grinding, lapping or honing. Dowel pin holes can be drilled undersize, the piece hardened and the hole reamed to size. *Whitman & Barnes.*

For more data circle No. 38 on postcard, p. 133

Industrial hammer grinder

This new industrial hammer grinder is used for reducing and pulverizing foundry facings, fireclay, asbestos, feldspar, glass, graphite, gypsum, hard rubber mica, plastic, wood and various other substances. It will handle anything grindable and can finish it to any desired degree of fineness. All grinding is done in mid-air. Swinging hammers of special abra-



sion resistant alloy steel repeatedly strike the material while it is in a state of suspension and then pass it through a heavy steel screen, which is perforated to fineness desired.

Rugged, arc welded steel construction is used throughout. Body is made of extra heavy steel plate and mounted on a structural steel base. Self-aligning ball bearings are used. All working parts are made of special abrasion resistant materials and points of wear are reinforced. Hammers can be reversed for longer life and screens can be changed in less than 30 seconds without removing mill cover. Available in 5 models, with throat openings from 12-24 in. in a motor range from 30 to 150 hp. *The Duplex Mill and Mfg. Co.*

For more data circle No. 39 on postcard, p. 133

Chaser die head

Straight, regular and reverse taper threads can be cut on the latest style, DMRT insert chaser die head. It will cut ⅛ to ¾ in pipe threads and is designed to fit the No. 2 Brown and Sharpe automatic screw machine. Adjustment for size has been made convenient by a notched adjusting ring. *Eastern Machine Screw Corp.*

For more data circle No. 40 on postcard, p. 133

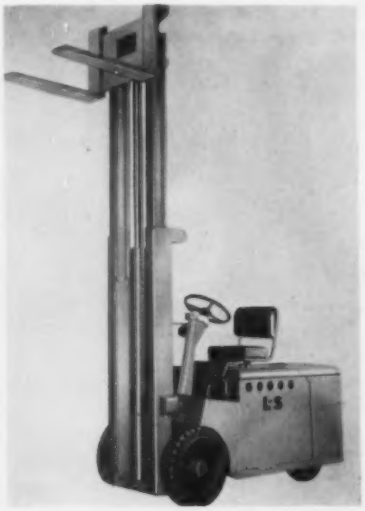
Eddy current braking of electric monorail hoists

Announcement of what is believed to be industry's first application of minute eddy current braking to electric monorail type hoists has been made. This motor braking principal is said to find its greatest usage where exceeding gentle hoisting and lowering is essential because of the nature of the load. Such operations as die handling, core setting, mold handling and subassemblies of precision machined parts can be more effectively handled with an eddy current brake hoist. It provides positive control from no load to full capacity when hoisting or lowering by electro magnetically providing a full capacity load on the hoist motor at all times. Brake automatically figures resistance. *Yale & Towne Mfg. Co.*

For more data circle No. 41 on postcard, p. 133

Electric fork trucks

Completely new line of heavy duty electric fork trucks in capacities to 7000 lbs—has just been introduced. Trucks feature a new rear wheel gear drive powered by two heavy duty compound wound traction motors with an electric differential. Drive assembly is spring-mounted to assure constant traction on both



drive wheels. With the rear drive, truck has maximum maneuverability since it can pivot about a point on the center line of the truck. It features a high pressure (2800 psi) hydraulic system with compact components giving faster lift speeds. Overall length: 130⅝ in. Fork length: 36 in. Overall width: 42 in. Traction speed: 5½ mph. *Lewis-Shepard.*

For more data circle No. 44 on postcard, p. 133

Removable reamer head

Only the part that wears out need be replaced on a new reamer. Quickly installed removable heads are used. A new thread design as-

sures snug fitting. Head and arbor firmly lock. Comes in ½ to 2¾ in. heads. Shank material is made of less expensive steel, compared with one-piece reamer requirements. *Tomkins-Johnson Co.*

For more data circle No. 45 on postcard, p. 133

Furnaces by Lucifer

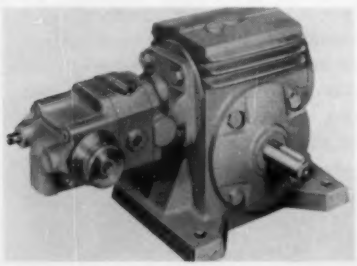
Two independent furnaces work in the space usually allotted to one with introduction of a new model. With independent controls, hardening furnace is available in both

2000° and 2300° F range. Drawing furnace has maximum of 800° F. Quench tank is included except with largest standard model. All standard models include automatic controller. *Lucifer Furnaces, Inc.*

For more data circle No. 42 on postcard, p. 133

Low cost fluid motor

Slow output RPM is combined with a torque multiplication with a new, low cost, speed control-fluid, motor-speed reducer. The fluid motor is equipped with a built-in relief valve that allows maximum torque input to the speed reducer and prevents overloading. It is used for conveyor drives where variable speed is re-

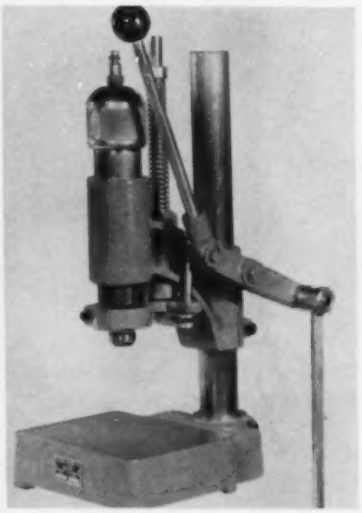


quired. The fluid motor is built and can be furnished with or without speed control valve. Available in wide ratio ranges. Company says that it is available to handle 0-2, 0-4 and 0-6 gpm. Motors have gear widths of ½, ¾ or one in. *John S. Barnes Corp.*

For more data circle No. 43 on postcard, p. 133

Repeating air hammer

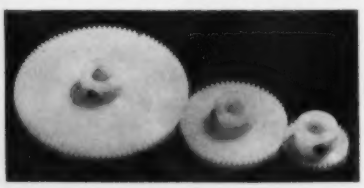
A new air operated impact machine uses the same base and frame as older models, but there the resemblance ends. It is radically different in hammer mechanism and in operation. The new series machines made by this firm are all single-acting air hammers, with the hammer delivering a single impact each time the foot pedal is pressed. They use constant air pressure. Impact is controlled by varying the hammer stroke. According to the company these hammers are highly effective for riveting, light swaging and upsetting, planishing and seam-crimping in sheet metal. *Heidrich-Nourse Co.*



For more data circle No. 46 on postcard, p. 133

Non-metallic gears

Precision non-metallic spur gears are now available from company's stock in both nylon and phenolic linen material. They come in four fine pitch sizes: 48, 64, 72 and 96.



These non-metallic spur gears are available in ⅛, 3/16 and ¼ in. bore. Gears are cut to AGMA Precision 1 tolerances. *PIC Design Corp.*

For more data circle No. 47 on postcard, p. 133

For your selection

ALTEMP

HIGH TEMPERATURE SUPER ALLOY STEELS

ALTEMP A-286 . . . an austenitic iron-nickel-chromium alloy made heat-treatable by the addition of titanium. Designed to maintain high strength and corrosion-resistance up to the 1350 F range, and to afford satisfactory scale resistance up to 1800 F.

A-286 was developed in the A-L Research Laboratory in Watervliet, N.Y., in the 1949-51 period. Among the high-strength, heat-resisting alloys, it has exceptionally low strategic alloy content, improved hot-working and machining qualities, and good center ductility in large sections. Currently used in jet engines and superchargers for such applications as turbine wheels and blades, frames, casings, afterburner parts, bolting, etc.

This alloy is readily produced in large quantities without the need of special steel-making equipment. It is available in the form of billets, bars, forgings, sheet, strip, tubing and hot-extruded shapes.

ALTEMP S-816 . . . a chromium-nickel-cobalt base alloy, strengthened by additions of molybdenum and tungsten, and with a columbium-carbon ratio of ten to one to insure its structural stability. Designed for high strength and corrosion-resistance service in the 1200-1500 F range, and at higher temperatures under lower stress conditions. Developed in the A-L Research Laboratory at Watervliet, N.Y. in the years of 1940-43, and engine-tested and proved for periods of over 30,000 hours.

S-816 is used currently for turbine blades in two of the production jet engines, also in a number of experimental aircraft and commercial gas turbines. Except for seamless drawn tubing, it is available in practically all forms and shapes in which stainless steels are processed, including hot extrusions.

ALTEMP S-590 was designed for service in the range of 1100-1400 F temperatures where high strength and corrosion resistance are required, and where cost is also a factor. Unlike S-816, which is practically a non-ferrous alloy, S-590 has a chromium-nickel-cobalt-iron base. However, it employs the same molybdenum and tungsten additives, and the same columbium-carbon ratio.

S-590 was developed at the Watervliet Laboratory and field-proved during the same years as S-816. It is available in the same shapes and forms, and is currently being used for turbine blades and wheels in experimental commercial gas turbines.

OTHER GRADES . . . among the many other Super Alloys made by Allegheny Ludlum are V-36, M-252, 19-9 DL, 19-9 DX and Waspaloy.

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. . . this one cost less than ½¢

The difference is . . . Scott Wipers

Strong, highly absorbent Scott Wipers can be used and re-used. Yet they cost so little you can throw them away after a single use when the job calls for a clean wiper, free of chips and abrasive material.

Scott Wipers are reducing the cost of wiping in many companies. Sorting and baling are eliminated. Handling and distribution are simplified. Laundering becomes a thing of the past.

This is sanitary wiping. A man uses a Scott Wiper thoroughly, throws it away—takes a new one. No danger of cuts from hidden chips . . . no fear of skin infection from dirty wipers.

Your local Scott representative or distributor will demonstrate the Scott Wiper in your plant. Call him or mail this coupon today.

Another quality product of . . .

SCOTT PAPER COMPANY

Scott Paper Company
Dept. W-4, Chester, Pa.

Please send me more information about Scott Wipers.

Name _____

Company _____

Position _____

Address _____

REMINDER LIST
of maintenance steel products

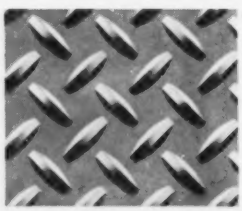
You can save time and trouble in the weeks ahead if you will take a minute now to review your coming requirements for maintenance steel products—those you will want for summer shut-down work as well as your more immediate needs.

All the products listed below are in good supply at Ryerson right now, and, of course, we have many other maintenance products ready for quick shipment as well—boiler tubes, chain and accessories, tool steel, etc.

When you combine all maintenance steel requirements on one order you may save more than purchasing time. Freight costs may be lower, and prices, too, under the Ryerson quantity differential plan.

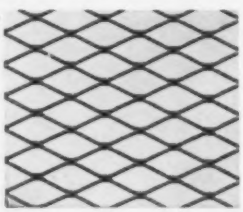
Perhaps this list will suggest ways to plan ahead and save

COLD FINISHED SHAFTING—Ryerson stocks of turned, ground and polished bars (C-1025, C-1045 and C-1141) provide a ready source for shafting of outstanding size accuracy, straightness and concentricity. For greater strength draw on Ryerson stocks of heat treated Rycrome—a medium carbon alloy.



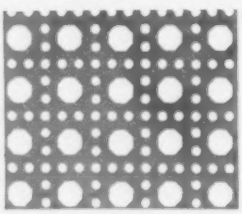
SAFETY PLATE—Tough, rolled steel plate with the Inland 4-WAY safety pattern is available in two pattern sizes for industrial flooring, stairs, ramps, platforms, etc. Firesafe, long wearing, easy to clean, it provides good traction for feet or wheels and presents an attractive appearance. Easy to fabricate and install.

EXPANDED METAL—Furnished in two basic types, standard and flattened, Ryex expanded metal is light yet strong and rigid—easy to handle because all sharp edges have been removed. Use it for room enclosures, machine guards, grilles, shelves, bins, etc. Also available: Ryex expanded metal grating.



WELDED GRATING for strong, rigid and durable open steel flooring is available from Ryerson in stock size panels and sizes tailor-made for your job with all necessary cut-outs and banding. Easily installed and maintained, Ryerson welded grating can be furnished painted or galvanized. Send for engineering data.

STAINLESS PIPE & TUBING and fittings as well, are on hand in a complete range of types—304, 316 and 304-L for welding applications involving severe corrosion, and in a comprehensive range of sizes including schedules 5, 10, 40 and 80 pipe sizes. Valves and welding and screwed type fittings also available.



PERFORATED SHEETS are on hand for immediate shipment in standard cane and machine guard patterns. And you can also get quick service on a wide variety of other patterns perforated to order from large Ryerson stocks of carbon steel and stainless sheets and plates. Send for descriptive literature.

GALVANIZED SHEETS—Tight-coated galvanized that forms without flaking is available in a wide range of gauges and sizes. Sheets take paint or lacquer readily without "weathering." And for roofing, siding, etc. they can be furnished with standard corrugation or with the attractive new mansard corrugation.

GLYCO BABBITT METAL AND RYERTEX BEARINGS—Glyco Babbitt, produced in our own foundry from top quality virgin metals, is available in five grades to meet every babbitt bearing requirement. Ryertex plastic bearings which need only water lubrication can also be furnished promptly—in any size or shape.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, re-bars, machinery and tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI
CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age SUMMARY . . .

Third quarter letdown would be welcome relief to consumers of tight products . . . Export also would benefit . . . Automotive letdown important . . . Scrap prices due for rebound.

Good For Someone . . . An easier third quarter in steel would be a god-send for consumers of hard-to-get products. Foreign consumers also would welcome relief from the months-long steel drought.

So the outlook in steel all depends upon where you sit. If labor negotiations are settled peacefully, a letdown in third quarter is inevitable. But the market's expected softness will be only relative.

Consumers of hot-rolled sheets, plates, and structurals already are beginning to benefit somewhat from the easing in cold-rolled sheet and strip. Mills that several months ago scorned hot-rolled sheet business are actively soliciting it now. Same goes for light plate—some sheet mills are now happy to turn out a tonnage of plate.

Meanwhile, demand from the oil and gas fields continues to hold up the tubular end of the steel business. There's no such thing as heavy inventory in oil country goods and line pipe. Some users are literally living out of freight cars.

It's A Gamble . . . Even those steel users who are now heavy on inventory and adopting a lethargic attitude toward new commitments from the mills, are admittedly taking a gamble. If steel labor talks go awry, it will be every man for himself after the strike is over.

Mills are now telling their customers there can be no guarantee of delivery after July 1. This is not because of pessimism over the labor outlook. It's simply a realization that if there is a strike—no matter how brief—steel order books would be a mess for weeks afterward.

Steel demand from automotive companies is not likely to improve until production of new models gets underway. Stocks of new cars are estimated at 900,000. The car builders consider 350,000 about right just prior to new model production. So production now is being geared to achieving that ideal inventory level. If the industry sells 350,000 cars per month between now and September, its planning will work out.

Scrap Outlook . . . The scrap market slipped again this week, as mills continue to hold off pending outcome of steel labor talks. But meanwhile, scrap consumers are nibbling away at inventories. And the market is likely to rebound quickly after it becomes clear which way the steel labor winds are blowing.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,375	2,375	2,462	2,330
Ingot Index				
(1947-1949=100)	147.8	147.8	153.3	145.0
Operating Rates				
Chicago	98.5	99.0	100.0	100.0
Pittsburgh	98.0	98.0	103.0	97.0
Philadelphia	106.0	106.0*	100.0	96.0
Valley	98.0	99.0	98.0	96.0
West	102.0	102.0	103.0	102.0
Detroit	100.0	97.0*	97.0	92.0
Buffalo	105.0	105.0	105.0	105.0
Cleveland	105.0	103.0	104.0	104.0
Birmingham	23.5	23.5	93.0	96.0
S. Ohio River	94.0	90.0*	94.5	83.0
Wheeling	103.0	104.0*	103.0	95.0
St. Louis	95.0	99.0	100.0	106.0
Northeast	93.0	93.0	92.0	90.0
Aggregate	96.5	96.5	100.0	96.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.179	5.179	5.179	4.797
Pig Iron (Gross Ton)	$60.29	$60.29	$60.29	$56.59
Scrap, No. 1 hvy (gross ton)	$45.83	$47.50	$53.17	$34.67
Nonferrous				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	34.50	34.50	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	93.625	96.25	98.875	91.125
Zinc, E. St. Louis	13.50	13.50	13.50	12.00

Warehouses Report High Sales

But smaller distributors are experiencing lower volume . . . Some firms building inventories in face of certain summer slackening . . . Possible strike a factor.

◆ VARYING REPORTS from warehouses reveal mixed feelings on future market conditions. Their buying policies follow no consistent pattern and individual firms appear to be relying on pet theories and hunches on which way demand will turn.

Larger warehouses generally are faring better than small. While many small and medium-sized firms were reporting a slackening in the final two weeks of May, some major warehouses claimed May to be their best month so far this year. April was conceded to be a very good month, but with final May sales totaled, the bigger outfits say that May was even better.

Nearly everybody expects a weakening in June and there is talk of doldrums come July and August, but you wouldn't know it from the way some warehouses are stockpiling. Despite heavy inventories of cold-rolled sheet, for instance, some distributors are planning to take a full mill quota through June and indicate they'll continue building sheet inventory. It may be they are putting their money on a strike in the steel industry.

Increase of stainless steel prices by U. S. Steel and Allegheny-Ludlum are confined to engineering grades where special heat resistance or stability requirements call for close control, additions of titanium, etc. The move could not be considered a general increase in stainless prices.

American Iron and Steel Institute figures on production of these special grades in terms of ingots for the first quarter of 1956 are: No. 308—1630; No. 309—2456; No. 310—2321; No. 316—16,128; No. 321—10,775; No. 347—3627. These tonnages represent only 11 pct of the total (313,334 net tons).

SHEET AND STRIP . . . **Pittsburgh** producers report that users of hot-rolled products are taking up the slack left by cold-rolled order cutbacks. One mill has a full order book through the third quarter for hot-rolled products. Another expects the swing back to hot-rolled production to keep steelmaking operations at capacity for the rest of the year. A third producer expects automotive buying to hit a low point in July and August but sees little change in the ratio of hot-rolled to cold-rolled products. In **Chicago**, hot-rolled sheet is becoming fairly current. But demand is low for cold-rolled. At least two auto makers are offering cold-rolled to warehouses. Hot-rolled sheet is slackening in consumer demand as well, so any remaining carryover probably will be wiped out this month. The only bright spot in the **Detroit** market is hot-rolled sheet and the situation is easing rapidly. All other types, cold-rolled, long ternes, enameling iron and zinc-coated are quite easy.

BARS . . . Production of carbon bars continues at capacity in **Pittsburgh** and orders are holding up well through July. One mill looks for a falloff at the end of July lasting through August. Wyckoff Steel Co., producer of cold-finished bars, will be closed down from June 29 to July 16 for vacation and maintenance. In **Chicago**, cold-finished bar for immediate delivery is available in some grades, but delivery is still slow on specially heat treated stock or off sizes. Reason is that mill hot-rolled isn't yet available in heavy lots. Warehouses are fairly well stocked with hot-rolled and most users can get it there if mills fall short. One mill has reduced June quotas of hot-rolled bar by 20-30 pct to bring shipments current by end of June. Another has a four-week carryover which is expected to dwindle out during July. **Detroit** reports merchant bars, alloys, cold drawn and forging bars are easy to get now. Nobody expects any pickup until the end of August.

PLATE AND STRUCTURALS . . . The market in **Chicago** continues very tight and no relief—even with cutback in other hot-rolled flat products—is seen for the immediate future. The same goes for structurals, where bookings still run out through the end of the year and carryovers run to four weeks and longer. Demand in **Detroit** continues strong. Indications are that demand for light gage plate will be fairly well filled by the end of August.

WAREHOUSES . . . The situation in general is spotty. Some warehouses in the area have been reporting a business drop, some as early as the beginning of May. There had been a mild weakening in the first two weeks of April but this tightened again and the month—on the whole—was very good. But by the last two weeks of May, even some of the specialty houses were reporting weakening sales. Some very large warehouses, however, actually exceeded April sales in May. Despite heavy inventories of cold-rolled sheets, some distributors are planning to take a full mill quota through June.

TINPLATE . . . **Pittsburgh** mills are turning out all the tinplate they can make. Shipment releases continue to lag but production is high and the mills are working against orders.

PIPE . . . Demand for oil country goods in general is as strong as ever. Order books are filled as far ahead as the mills will open them. A group of purchasing agents has called the situation "desperate." On standard pipe, the mills could use a few more orders, but business is still very good. Some slight easing of pipe supply may develop as steel is diverted from flat-rolled production. One mill is building inventory in skelp form but is critically short in seamless items.

Purchasing Agent's Checklist

Comparison of Prices

(Effective June 5, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 5 1956	May 29 1956	May 3 1956	May 10 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.28	6.28	6.28	5.79
Plate	4.52	4.52	4.52	4.225
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.85	$9.45*	$9.45*	$9.05
Tinplate, electro (0.50 lb.)	8.55	8.15*	8.15†	7.75
Special coated mfg. ternes	9.10	8.70*	8.70*	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.30¢
Cold finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	6.60¢	6.60¢	6.60¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.45
Light rails	5.65	5.65	5.65	5.35
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$64.00
Slabs, rerolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.179¢	5.179¢	5.179¢	4.797¢

	June 5 1956	May 29 1956	May 3 1956	May 10 1955
Pig Iron: (per gross ton)				
Foundry del'd Phila.	$65.26	$65.26	$65.26	$61.19
Foundry Valley	60.50	60.50	60.50	56.50
Foundry, Southern Cin'ti	62.93	62.93	62.93	60.43
Foundry, Birmingham	55.00	55.00	55.00	52.88
Foundry, Chicago	60.50	60.50	60.50	56.50
Basic del'd Philadelphia	64.48	64.48	64.48	60.27
Basic, Valley furnace	60.00	60.00	60.00	56.00
Malleable, Chicago	60.50	60.50	60.50	56.50
Malleable, Valley	60.50	60.50	60.50	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$60.29	$60.29	$60.29	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$44.50*	$45.50	$51.50	$34.50
No. 1 steel, Phila. area	*47.50*	49.50	55.50	35.00
No. 1 steel, Chicago	*45.50*	48.50	52.50	33.50
No. 1 bundles, Detroit	*37.50*	41.50	49.50	27.00
Low phos., Youngstown	*51.00*	51.50	59.50	35.50
No. 1 mach'y cast, Pittsburgh	56.50	56.50	57.50	43.50
No. 1 mach'y cast, Philadel'a	54.50	54.50	55.50	44.50
No. 1 mach'y cast, Chicago	*49.50*	51.50	54.50	46.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$44.83*	$47.50	$53.17	$34.67
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50	$14.50	$14.25	$13.00
Foundry coke, prompt	17.50	17.50	17.50	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	46.00	46.00	46.00	36.00
Copper, Lake, Conn.	46.00	46.00	46.00	36.00
Tin, Straits, New York	*93.625*†	96.25	98.875	91.125
Zinc, East St. Louis	18.50	18.50	18.50	12.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Aluminum, virgin ingot	25.90	25.90	25.90	22.20
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	34.50	34.50	34.50	29.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. *Revised.

‡ 74.76 pct Mn base.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 180→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	62.00	62.50	63.00	63.50	.....
Birdsboro, Pa. *B6*	62.00	62.50	63.00	63.50	.....
Birmingham *R3*	54.50	55.00*	.....	.....	.....
Birmingham *W9*	54.50	55.00*	59.00	.....	.....
Birmingham *U4*	54.50	55.00*	59.00	.....	.....
Buffalo *R3*	60.00	60.50	61.00	61.50	.....
Buffalo *H1*	60.00	60.50	61.00	.....	.....
Buffalo *W6*	60.00	60.50	61.00	61.50	.....
Chester *C17*	62.00	62.50	63.00	.....	.....
Chicago *I4*	60.00	60.50	60.50	61.00	.....
Cleveland *A5*	60.00	60.50	60.50	61.00	65.00†
Cleveland *R3*	60.00	60.50	60.50	61.00	.....
Duluth *I4*	60.00	60.50	60.50	61.00	65.00
Erie *I4*	60.00	60.50	60.50	61.00	65.00
Everett *M6*	.....	62.50	63.00	.....	.....
Fontana *K1*	67.50	68.00	.....	.....	.....
Geneva, Utah *C7*	60.00	60.50	.....	.....	.....
Granite City *G2*	61.90	62.40	62.90	.....	.....
Hubbard *Y1*	.....	.....	60.50	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Midland *C11*	60.00	.....	.....	.....	.....
Minnequa *C6*	62.00	62.50	63.00	.....	.....
Monessen *P6*	60.00	.....	.....	.....	.....
Neville Is. *P4*	60.00	60.50	60.50	61.00	65.00†
N. Tonawanda *T1*	.....	60.50	61.00	61.50	.....
Pittsburgh *U1*	60.00	.....	60.50	61.00	.....
Sharpsville *S3*	60.00	60.50	60.50	61.00	.....
So. Chicago *R3*	60.00	.....	60.50	.....	.....
Steelton *B3*	62.00	62.50	63.00	63.50	68.00
Swedeland *A2*	62.00	62.50	63.00	63.50	.....
Toledo *I4*	60.00	60.50	60.50	61.00	.....
Troy, N. Y. *R3*	62.00	62.50	63.00	63.50	68.00
Youngstown *Y1*	.....	.....	60.50	61.00	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos.† Intermediate low phos.

Silvery Iron Buffalo, *H1*, $68.75; Jackson, *J1*, *G1*, $87.50. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	201	202	301	302	303	304	316	321	348	410	416	430
Ingots, reroll.	18.50	19.75	19.25	20.50	—	21.75	33.00	26.50	35.25	15.00	—	15.25
Slabs, billets, reroll.	23.00	25.50	23.75	26.25	26.75	27.50	41.75	33.50	44.50	19.50	—	19.75
Forg. dcs., die blks., rgs.	—	—	—	—	—	—	—	—	—	—	—	—
Billets, forging	—	31.00	31.75	32.00	34.75	33.75	52.75	39.75	52.50	25.50	26.00	26.00
Bars, struct.	—	36.75	38.00	38.25	41.00	40.25	62.75	47.25	62.00	30.50	31.00	31.00
Plates	—	38.75	40.00	40.25	42.75	43.00	66.00	51.25	66.75	31.75	33.00	32.25
Sheets	42.25	42.50	44.25	44.50	52.25	47.25	70.25	56.25	75.50	36.25	—	36.75
Strip, hot-rolled	31.00	33.50	32.00	34.50	—	37.25	59.75	45.75	61.25	28.00	—	28.75
Strip, cold-rolled	39.00	42.50	41.00	44.50	—	47.25	70.25	56.25	75.50	36.25	—	36.75
Wire CF, HR; Rod HR	—	—	36.00	36.25	39.00	38.25	59.75	45.00	59.00	29.00	29.50	29.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2,* (2.25¢ lower on Type 430) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Philadelphia, *D5.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6.*

Bar: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5;* Ft. Wayne, *I4;* Philadelphia, *D5;* Detroit, *R5.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Philadelphia, *D5.*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forgings billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5.*

Market Trend Still Downward

Concern about possible steel strike and uncertainty over third quarter prospects are reflected in declining prices . . . Mills set mid-June delivery deadline.

◆ THE CAUTION LIGHT is still on this week and while there is buying activity, prices continue to decline. Causes are uncertainty about outcome of steel wage talks and a bearish feeling about industrial outlook for the third quarter.

Mills, reflecting concern about a possible steel strike, are placing a shipping deadline of June 15 to 22 on scrap purchases.

Only indication of market stability is in Pittsburgh where mill buying and the fact that prices paid last week were holding up seemed to indicate some steadying. However, these earlier buys reflected declines of from $1 to $2.50.

Nationwide prices of No. 1 heavy melting dropped $2 to $4. Purchase of No. 2 heavy melting in one area at $1 higher indicates that steelmaking grades are not available in quantity. This meant that any large purchases by mills could quickly peg the market or even push it up.

Declines were the rule, however, and THE IRON AGE composite, reflecting this, was down to $45.83.

Pittsburgh . . . Heavy mill buying sought to stabilize scrap prices at $45 for No. 1 heavy melting, $40 for No. 2 heavy melting and $37 for No. 2 bundles. These prices represent declines of from $1 to $2.50. But the heavy tonnage bought and the fact that a late buy showed no drop from prices paid several days earlier indicate that a floor has been placed under the openhearth market. Blast furnace grades are down $1 on a mill purchase.

Chicago . . . Turnings were exhibiting great weakness in the absence of any heavy buying, and the current price for these grades is regarded as likely to continue to slip on new purchases. Steelmaking grades, though not moving in strong quantity at new, lower prices early last week, were moving in quantity by week's end, and the lists generally showed greater weakness in mill purchasing. Nonetheless, dealer stocks are not high, and it is felt any weakening is largely due to the possibility of a steel strike.

Philadelphia . . . After several weeks of inactivity, a major consumer came into the market, bought steelmaking grades at $2 less than previous orders. Purchase involved only light tonnages, with consumers exhibiting caution against the possibility of a steel strike. Low phos and other premium grades registered even more significant price declines.

New York . . . Recent purchase by a major mill in an adjacent consuming district has failed to give real strength to this market. Both steel making and blast furnace grades have continued to slip from lack of business. No. 1 heavy melting is now moving at $41 top and short shoveling turnings at $29 maximum.

Detroit . . . No. 1 grades dropped $4 this week on the basis of a sale to a local mill. No. 2 bundles, purchased by the same mill, declined $1.50. The market remains soft and there are no signs that it has leveled off. Fear of a strike has caused the mills to place a shipping deadline for scrap at June 22. Shoveling turnings and cast iron borings should have been quoted at $24 to $25 in May 31 issue. No. 1 cupola cast should have been quoted at $41-$42.

Cleveland . . . Valley price for primary grades slipped another $1 and Cleveland price dropped 50¢ on sale to local mill. Small tonnage of No. 2 heavy melting in Cleveland went at $42. End of weakness is not in sight. Remaining two local auto lists of prime industrial scrap went for near $48. Most mills and brokers are specifying delivery on new orders must be made by June 15 or 20 due to strike possibility. One Valley mill bought No. 2 heavy melting at $39 and No. 2 bundles at $36, and an electric furnace steel producer bought low phos at $52. Another Valley mill paid $50 for No. 1 heavy melting.

Birmingham . . . Openhearth grades are weak in view of continued strike at Tennessee Coal & Iron Div., U. S. Steel Corp. Cast market continued firm, but prices held unchanged. Electric furnace grades are active, and prices steady. Railroad specialties show signs of weakening. No. 1 railroad dropped $1.

St. Louis . . . Scrap market shows continued weakness, the recent advances having brought out a heavy movement, and there is uncertainty as to the outcome of the wage negotiations in the steel industry and the outlook for third quarter business. Most items are lower in price with the sharpest declines as much as $5 per ton for foundry grades.

Cincinnati . . . Fringe area consumers placed regular monthly tonnage orders and dealers are attempting to sell slightly over regular tonnage despite low prices. Normal melt for month was placed since no strike interruption here is probable. For other consumers, however, early June deadline delivery dates are being specified.

Buffalo . . . The area's largest consumer entered the market this week and prices of secondary grades declined. Turnings also were off. The purchase set a new price pattern following a lull.

Boston . . . Most prices continue to drop in the wake of continued inactivity in the market. Little scrap is being exported, contributing to the general weakness.

West Coast . . . Prices firmed up in San Francisco and settled at lower levels in Los Angeles and Seattle. Mills say they're getting all they need despite good-sized tonnage heading for export.

Scrap Prices *(Effective June 5, 1956)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and ms. turn.	32.00 to 33.00
Shoveling turnings	36.00 to 37.00
Cast iron borings	36.00 to 37.00
Low phos. punch'gs plate	53.00 to 54.00
Heavy turnings	42.00 to 43.00
No. 1 RR. hvy. melting	51.00 to 52.00
Scrap rails, random lgth.	62.00 to 63.00
Rails 2 ft and under	67.00 to 68.00
RR. steel wheels	59.00 to 60.00
RR. spring steel	59.00 to 60.00
RR. couplers and knuckles	59.00 to 60.00
No. 1 machinery cast	56.00 to 57.00
Cupola cast	49.00 to 50.00
Heavy breakable cast	48.00 to 49.00

Chicago

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	37.00 to 39.00
No. 1 factory bundles	51.00 to 52.00
No. 1 dealers' bundles	46.00 to 47.00
No. 2 dealers' bundles	33.00 to 34.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. forge crops	55.00 to 57.00
Low phos. punch'gs plate	52.00 to 54.00
Low phos. 3 ft and under	51.00 to 52.00
No. 1 RR. hvy. melting	52.00 to 54.00
Scrap rails, random lgth.	62.00 to 63.00
Rerolling rails	70.00 to 71.00
Rails 2 ft and under	69.00 to 70.00
Locomotive tires, cut	57.00 to 58.00
Cut bolsters & side frames	57.00 to 58.00
Angles and splice bars	63.00 to 64.00
RR. steel car axles	69.00 to 70.00
RR. couplers and knuckles	56.00 to 57.00
No. 1 machine cast	49.00 to 50.00
Cupola cast	45.00 to 46.00
Heavy breakable cast	39.00 to 40.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheel	50.00 to 51.00
Malleable	59.00 to 60.00
Stove plate	41.00 to 42.00
Steel car wheels	55.00 to 56.00

Philadelphia Area

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	47.00 to 48.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	31.00 to 32.00
Mixed bor. short turn.	34.00 to 35.00
Cast iron borings	38.00 to 39.00
Shoveling turnings	36.00 to 37.00
Clean cast chem. borings	43.00 to 44.00
Low phos. 5 ft and under	51.00 to 52.00
Low phos. 2 ft and under	52.00 to 53.00
Low phos. punch'gs	52.00 to 53.00
Elec. furnace bundles	49.00 to 50.00
Heavy turnings	43.00 to 44.00
RR. steel wheels	58.00 to 59.00
RR. spring steel	58.00 to 59.00
Rails 18 in. and under	63.00 to 64.00
Cupola cast	48.00 to 49.00
Heavy breakable cast	52.00 to 53.00
Cast iron car wheels	57.00 to 58.00
Malleable	64.00 to 65.00
Unstripped motor blocks	37.00 to 38.00
No. 1 machinery cast	54.00 to 55.00

Cleveland

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	47.00 to 48.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	34.00 to 35.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Cut struct'r'l & plates, 2 ft & under	51.00 to 52.00
Drop forge flashings	47.00 to 48.00
Low phos. punch'gs, plate	48.50 to 49.50
Foundry steel, 2 ft & under	49.00 to 50.00
No. 1 RR. heavy melting	50.00 to 51.00
Rails 2 ft and under	68.00 to 69.00
Rails 18 in. and under	69.00 to 70.00
Railroad grate bars	39.00 to 40.00
Steel axle turnings	37.00 to 38.00
Railroad cast	54.00 to 55.00
No. 1 machinery cast	54.00 to 55.00
Stove plate	51.00 to 52.00
Malleable	59.00 to 60.00

Youngstown

No. 1 hvy. melting	$49.00 to $50.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	49.00 to 50.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	30.00 to 31.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	35.00 to 36.00
Low phos. plate	50.00 to 52.00

Buffalo

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 busheling	46.00 to 47.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	53.00 to 54.00
Scrap rails, random lgth.	60.00 to 61.00
Rails 2 ft and under	68.00 to 69.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast	53.00 to 54.00
No. 1 cupola cast	50.00 to 51.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	37.00 to 38.00
No. 2 bundles	26.50 to 27.50
New busheling	37.00 to 38.00
Drop forge flashings	36.50 to 37.50
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs, plate	37.00 to 38.00
No. 1 cupola cast	41.00 to 42.00
Heavy breakable cast	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	43.50 to 44.50
No. 2 bundles	32.00 to 33.00
Machine shop turn.	26.00 to 27.00
Cast iron borings	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
No. 1 RR. hvy. melting	50.00 to 51.00
Rails, random lengths	56.00 to 57.00
Rails 18 in. and under	63.00 to 64.00
Locomotive tires uncut	51.00 to 52.00
Angles and splice bars	51.00 to 52.00
Std. steel car axles	56.00 to 57.00
RR. specialties	51.00 to 52.00
Cupola cast	46.00 to 47.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	42.00 to 43.00
Stove plate	40.00 to 41.00
Cast iron car wheels	48.00 to 49.00
Rerolling rails	32.00 to 33.00
Malleable	58.00 to 59.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 28.50
No. 1 bundles	35.00 to 36.00
No. 2 bundles	27.00 to 27.50
No. 1 busheling	35.00 to 36.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Machine shop turn.	20.00 to 20.50
Mixed bor. and short turn.	26.00 to 26.50
Shoveling turnings	27.00 to 27.50
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	42.50 to 43.00
Mixed cupola cast	38.00 to 39.00
Heavy breakable cast	39.50 to 40.50
Stove plate	37.00 to 38.00
Unstripped motor blocks	25.50 to 26.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	31.00 to 32.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	28.00 to 29.00
Clean cast chem. borings	31.00 to 32.00
No. 1 machinery cast	47.00 to 48.00
Mixed yard cast	44.00 to 45.00
Charging box cast	44.00 to 45.00
Heavy breakable cast	44.00 to 45.00
Unstripped motor blocks	31.00 to 33.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	21.50 to 22.50
Electric furnace bundles	44.00 to 45.00
Bar crops and plates	52.00 to 53.00
Structural and plate, 2 ft	51.00 to 52.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	58.00 to 59.00
Rails, 18 in. and under	62.00 to 63.00
Angles & splice bars	57.00 to 58.00
Rerolling rails	65.00 to 66.00
No. 1 cupola cast	48.50 to 49.50
Stove plate	47.00 to 48.00
Charging box cast	32.00 to 33.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	37.50 to 38.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.50 to $43.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 bundles	42.50 to 43.50
No. 2 bundles	31.50 to 32.50
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	28.00 to 29.00
Low phos. 18 in. & under	53.00 to 54.00
Rails, random lengths	58.00 to 59.00
Rails, 18 in. and under	65.00 to 66.00
No. 1 cupola cast	43.00 to 44.00
Hvy. breakable cast	43.00 to 44.00
Drop broken cast	53.00 to 54.00

San Francisco

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	40.00
No. 1 bundles	42.00
No. 2 bundles	35.00
No. 3 bundles	29.00
Machine shop turn.	24.00
Cast iron borings	25.00
No. 1 RR. hvy. melting	43.00
No. 1 cupola cast	48.00

Los Angeles

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 1 bundles	41.00
No. 2 bundles	31.00
No. 3 bundles	27.00
Machine shop turn.	$21.00 to 22.00
Shoveling turnings	24.00
Cast iron borings	24.00
Elec. furn. 1 ft and under	42.00
No. 1 RR. hvy. melting	42.00
No. 1 cupola cast	45.00

Seattle

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	40.00
No. 2 bundles	31.00
No. 3 bundles	27.00
No. 1 cupola cast	45.00
Mixed yard cast	45.00

Hamilton, Ont.

No. 1 hvy. melting	$45.00
No. 2 hvy. melting	40.00
No. 1 bundles	45.00
No. 2 bundles	37.50
Mixed steel scrap	39.00
Bushelings	35.50
Bush., new fact., prep'd	43.00
Bush., new fact., unprep'd	39.00
Machine shop turn.	23.00
Short steel turn.	28.00
Mixed bor. and turn.	24.00
Rails, rerolling	53.00
Cast scrap	50.00

Is Nickel Distribution Fair?

Independents contend they are victimized in present system . . . Premium prices are the rule, frequently reach many times market price . . . Seek better policing system.

◆ THERE IS TROUBLE on the nickel front. And it's not going to be too easy to solve. The cry of inequitable distribution is not new, but the evidence of gray market activity, pressure, and even illegal transactions presented by independent electroplaters is making a hot issue.

Some electroplaters have been forced to buy nickel from questionable sources to keep from closing down their shops.

Another reports that a supplier agreed to sell him all the nickel anodes he needed, provided he placed an accompanying order for about $30,000 worth of chemicals.

Reports of price premiums as high as 400 pct above the list price are common.

Independent electroplaters maintain that they are primary victims of shortage and current allocations because (1) they are small establishments which must move nickel immediately or go out of business and (2) at the time base periods were set their inventories were relatively high and their buying was not representative of their needs.

Illegal activity is a known fact. Rated nickel orders for a month were found to exceed defense production. Investigation on this score is currently in progress. In addition to alleged forged ratings, it is believed that some defense contractors ordered considerably more nickel than they needed. Both systems would be comparatively easy since, under current setup, a user need only claim he has a defense order and needs a certain amount. He is not required to prove either to take delivery of the now precious metal.

And, it is reported that the Senate Small Business Committee has a case history in which International Nickel Co. sold metal to a distributor for the list price of 64.5¢ per lb, and the same nickel was finally purchased by Pittsburgh Steel Co. for $3 per lb.

Other nickel consumers readily agree that electroplaters are not in an enviable position. But all insist that everyone is in about the same boat. Stainless steel producers report that they are operating on little or no inventory and must work strictly from hand to mouth.

The question of what's to be done about it finds several areas of sharp discord. Some of the electroplaters have requested the government to take over full control of nickel allocations to nondefense users. Both ODM chief Arthur Flemming and International Nickel president Henry S. Wingate are sharply opposed to this. Mr. Wingate, whose company presently controls nondefense distribution, told the Senate Small Business Committee that he feels the company system was working much better than a government control system would. And Flemming feels that big difficulty is the shortage which government controls would not cure.

Government stockpiling plan was object of sharp criticism from Col. Willard F. Rockwell, former assistant to the Secretary of Defense. Col. Rockwell calls "government nickel hoarding unnecessary and asinine" and claims that it has caused "an artificial shortage."

Cooler heads indicate that a lot of the pressure could be taken off the electroplaters and all nickel consumers by better policing methods.

Most likely solution is increased activity of the Justice Dept. and stiffer penalties to those who use defense ratings to falsify orders. This has already been promised, and is in its initial preparatory stages.

Also, government administrators are studying possible methods of tightening up the loopholes in present system and double checking all defense orders.

MILL . . . Eastern Brass & Copper Co. has completed conversion from a warehouse to a custom mill, selling aluminum, brass and copper coil and strip at mill prices. Eastern has withdrawn its aluminum distributorship to concentrate on rerolling of strip, according to Herbert Barchoff, firm president. New facilities include an annealing oven and a 2-high rolling mill.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in May based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper		Straits tin, New York	97.011
Del'd Conn. Valley	46.00	Zinc, E. St. Louis	13.50
Lake copper, delivered	46.00	Lead, St. Louis	15.80

Note: Quotations are going prices.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	May 30	May 31	June 1	June 2	June 4	June 5
Copper, electro, Conn.	....	46.00	46.00	46.00	46.00	46.00
Copper, Lake, delivered	....	46.00	46.00	46.00	46.00	46.00
Tin, Straits, New York	....	93.875	93.75	....	93.625	93.625*
Zinc, East St. Louis	....	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	....	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices. **Tentative*

Spring steel within this range...

FOR THE MOST EXACTING NEEDS KNOWN TODAY!

• That this is the age of specialization is certainly true in the use of steels. And in this regard *Athenia Steel* customers benefit especially by two not-too-common factors. First, by extreme control of quality and uniformity, unsurpassed, seldom equalled *anywhere!* Secondly, by painstaking technical service to determine or develop precisely the right steel for any special need.

Here at Athenia we concentrate on cold rolled high carbon flat steels, custom made of .45 carbon and higher, in widths from .015″ to 16″ and thicknesses from .001″ to .065″. Full range of finishes and tempers. We also produce special narrow width stainless, and the new super-tough, corrosion resistant spring material, Nilcor*.

For a new and profitable experience in service and in steel controlled precisely to *your* needs... try us!

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Round and Shaped Steel Wire, Small Sizes

Nonferrous Prices *(Effective June 5, 1956)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1100, 3003	42.3	40.2	39.0	38.0
5052	49.8	44.9	43.2	41.4
6061-0	46.9	42.7	40.9	40.8

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6–8	43.1–44.8	58.1–61.7
12–14	43.8–45.2	59.0–63.3
24–26	46.8–47.2	69.2–73.6
36–38	55.1–55.7	92.0–95.8

Screw Machine Stock—2011-T-3

Size*	¼	⅜–⅝	¾–1	1¼–1½
Price	56.0	54.9	53.6	51.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length" →	72	96	120	144
.019 gage	$1.310	$1.742	$2.175	$2.605
.024 gage	1.630	2.177	2.707	3.247

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250–3.00	.250–2.00	.188	.081	.032
FS1 Stand. Grade	.....	65.6	66.5	75	100
FS1 Spec.	.....	88.9	91.1	103.5	163.1
Tread Plate	.....	67.8	68.9	.....	.....
Tooling Plate	70.2	.....	.....	.....	.....

Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade (FS)	66.4–69.0	67.5–69.6	72.1–72.7	84.9–85.8
Spec. Grade (AZ31B)	81.4–84.0	82.5–84.6	87.1–87.7	99.9–100.8

Alloy Ingot

AZ91B (Die Casting) ..... 35 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 39.25 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	93
Angles, HR	87	74	93
Plate, HR	97	87	95
Seamless tube	122	110	153
Shot, blocks	...	71	...

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	59.53	.....	.....	68.82
Brass, 70/30	56.60	57.14	.....	59.51
Brass, Low	61.35	61.89	61.29	64.16
Brass, R L	63.07	63.61	63.01	65.88
Brass, Naval	59.80	65.06	54.11	62.96
Munts Metal	57.84	51.85	53.65	.....
Comm. Bs.	65.33	65.87	65.27	67.89
Mang. Bz.	63.54	66.19	57.64	.....
Phos. Bz. 5%	86.79	84.44	87.29	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $12.10-$12.60; alloy, $15.00-$15.75; Plate, HR, commercially pure, $10.00-$10.50; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.00-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.55-$7.80; alloy, $7.55-$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb. freight alloyed 25.90
Aluminum pig 24.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be $43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be $74.75
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Cobalt, 97-99% (per lb) ..... $2.60 to $2.67
Copper, electro, Conn. Valley 46.00
Copper, Lake, delivered 46.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. ..$100 to $120
Lead, St. Louis 15.80
Lead, New York 16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig 33.75
ingot 34.50
Magnesium, sticks, 100 to 500 lb. 56.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $263 to $265
Nickel electro 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. $23 to $24
Platinum, dollars per troy oz. $103 to $105
Silver, New York, cents per troy oz. 90.75
Tin, New York 93.625*
Titanium sponge, grade A-1. $2.95 to $3.25
Zinc, East St. Louis 13.50
Zinc, New York 14.00
Zirconium sponge $10.00
*Tentative

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot
No. 115 ..... 37.00
No. 120 ..... 35.75
No. 123 ..... 34.75
80-10-10 ingot
No. 305 ..... 40.25
No. 315 ..... 38.50
88-10-2 ingot
No. 210 ..... 51.75
No. 215 ..... 48.00
No. 245 ..... 43.00
Yellow ingot
No. 405 ..... 28.75
Manganese bronze
No. 421 ..... 32.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.75-26.75
0.60 copper max. 25.50-26.50
Piston alloys (No. 122 type) .. 25.00-26.00
No. 12 alum. (No. 2 grade) ... 23.75-25.00
108 alloy 24.00-25.00
195 alloy 25.75-26.75
13 alloy (0.60 copper max.) ... 25.50-26.50
AXS-679 ..... 24.00-25.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 24.00-25.00
Grade 2—92-95% 23.25-24.25
Grade 3—90-92% 22.50-23.75
Grade 4—85-90% 22.00-23.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	42	41¼
Yellow brass	31¼	29
Red brass	37	36¼
Comm. bronze	38½	37¾
Mang. bronze	28½	28½
Yellow brass rod ends	31	....

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 32
No. 2 copper wire 30½
Light copper 28
*Refinery brass 28
* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 32
No. 2 copper wire 30½
Light copper 28
No. 1 composition 26
No. 1 comp. turnings 25½
Hvy. yellow brass solids 17
Brass pipe 18
Radiators 19

Aluminum

Mixed old cast. ..... 15 —16
Mixed new clips ..... 16½—17½
Mixed turnings, dry ..... 15 —16

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 29½—30
No. 2 copper wire ..... 26½—27
Light copper ..... 24 —24½
New type shell cuttings ... 26 —26½
Auto radiators (unsweated) .. 17 —17½
No. 1 composition ..... 23 —23½
No. 1 composition turnings ... 22 —22½
Unlined red car boxes ..... 18 —19
Cocks and faucets ..... 18½—19
Clean heavy yellow brass .... 15½—16
Brass pipe ..... 20½—21
New soft brass clippings ..... 22 —22½
No. 1 brass rod turnings ..... 19½—20

Aluminum

Alum. pistons and struts ..... 6 — 7
Aluminum crankcases ..... 11 —11½
1100 (2S) aluminum clippings 15 —15½
Old sheet and utensils ..... 11 —11½
Borings and turnings ..... 8 — 8½
Industrial castings ..... 11 —11½
2024 (24S) clippings ..... 12½—13

Zinc

New zinc clippings ..... 8 — 8½
Old zinc ..... 5 — 5½
Zinc routings 3¾
Old die cast scrap ..... 2¾— 3

Nickel and Monel

Pure nickel clippings ..... $1.50-$1.75
Clean nickel turnings $1.25
Nickel anodes ..... $1.50-$1.75
Nickel rod ends ..... $1.50-$1.75
New Monel clippings 75-85
Clean Monel turnings 60-70
Old sheet Monel 65-75
Nickel silver clippings, mixed 21
Nickel silver turnings, mixed 21

Lead

Soft scrap lead ..... 12½—13
Battery plates (dry) ..... 7 — 7¼
Batteries, acid free 4½

Miscellaneous

Block tin ..... 83 —84
No. 1 pewter ..... 62½—63
Auto babbitt ..... 42 —42½
Mixed common babbitt ..... 13½—14
Solder joints ..... 18½—19
Siphon tops 48
Small foundry type ..... 15¾—16
Monotype ..... 15 —15½
Lino. and stereotype ..... 13½—14
Electrotype ..... 13 —13¼
Hand picked type shells ..... 10½—11
Lino. and stereo. dross ..... 5¾— 6
Electro. dross ..... 4¾— 5

IRON AGE

STEEL PRICES

(Effective June 5, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.80 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.80 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.425 *B3*	9.10 *B3*		
	Claymont, Del.													13.45 *C11*
	Harrison, N. J.													
	Conshohocken, Pa.								4.375 *A2*	6.30 *A2*	6.425 *A2*			
	New Bedford, Mass.									6.70 *R6*				
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.80 *B3*							
	Boston, Mass.									6.80 *T8*				13.80 *T8*
	New Haven, Conn.									6.70 *D1* *A5*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.10 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.80 *N7* *A5*				*A5* 13.80 *N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*										13.45 *G4*
	Chicago, Ill.	$68.50 *U1*	$84.50 *R3, U1,W8*	$96.00 *R3, U1,W8*	5.45 *U1*	4.60 *U1, W8*	6.75 *U1, Y1*	4.60 *U1*	4.55 *A1* 4.325 *N4,W8*	6.35 *A1,T8*			7.20 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D1,D2, G3,M2,P11*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *U1*	$84.50 *U1*	$96.00 *U1, Y1*	6.45 *I3*	4.60 *U1 I3*	6.75 *U1, I3*		4.325 *I3, U1,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, U1,Y1*	9.30 *Y1*	7.20 *Y1, U1*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.	$68.50 *C10*	$84.50 *C10*	$96.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *U1, J3*	$84.50 *J3, U1,C11*	$96.00 *U1, C11*	5.45 *U1*	4.60 *U1, J3*	6.75 *U1, J3*	4.60 *U1*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio		$84.50 *C10*	$96.00 *Y1, C10*			6.75 *Y1*		4.325 *U1, Y1*	6.25 *Y1,C5*	6.425 *U1, Y1*	9.30 *Y1*	7.20 *U1, Y1*	13.45 *C5*
WEST	Fontana, Cal	$78.00 *K1*	$94.00 *K1*	$117.00 *K1*		5.30 *K1*	7.40 *K1*	5.45 *K1*	5.125 *K1*	8.00 *K1*	7.575 *K1*		8.95 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.30 *C7, B2*	7.45 *B2*		5.875 *C7 B2*	8.30 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.875 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			5.10 *C16* 4.60 *R3,T2*	6.75 *T2*		4.325 *R3,T2* 4.825 *C10*		6.425 *T2*			
	Houston, Lone Star, Texas	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	

IRON AGE

STEEL PRICES

(Effective June 5, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			5.375 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.375 *A2*	5.375 *A2*				6.425 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.375 *B3*			
	Fairless, Pa.	4.375 *U1*	5.375 *U1*				6.425 *U1*	7.925 *U1*				$9.70 *U1*	$8.40 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.475 *B3*	$9.70 *B3*	$8.40 *B3*	
	Worcester, Mass.										5.675 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.55 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.55 *A1* 4.325 *W8*					6.375 *U1*				5.375 *N4* 5.375 *A5, R3*			
	Sterling, Ill.										5.475 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.375 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.325 *N5*	5.325 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *I3, U1, Y1*	5.325 *I3, U1, Y1*	5.85 *U1, I3*	5.90 *U1, I3*	6.25 *U1*	6.375 *Y1, U1, I3*	7.875 *U1, Y1*			5.375 *Y1*	$9.60 *I3, U1, Y1*	$8.30 *I3, U1, Y1*	7.05 *U1, Y1*
	Granite City, Ill.	4.525 *G2*	5.525 *G2*	6.05 *G2*	6.10 *G2*								$8.40 *G2*	7.15 *G2*
	Kokomo, Ind.			5.95 *C9*							5.475 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*								
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3, N3*	5.325 *R3, N3*	5.85 *R3* 6.85 *N3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*					$8.30 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, U1, P6*	5.325 *J3, U1, P6*	5.85 *U1*	5.90 *U1, A7*		6.375 *J3, U1*	7.875 *U1*	8.60 *U1*		5.025 *P6* 5.375 *A5*	$9.60 *J3, U1*	$8.30 *J3, U1*	7.05 *U1*
	Portsmouth, Ohio	4.325 *P7*	5.325 *P7*								5.375 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5, F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$9.60 *W3, W5*	$8.30 *W3, W5*	7.05 *F3, W5*
	Youngstown, Ohio	4.325 *U1, Y1*	5.325 *Y1*		5.90 *Y1*		6.375 *U1, Y1*	7.875 *Y1*			5.375 *Y1*			
WEST	Fontana, Cal.	5.125 *K1*	6.525 *K1*				7.175 *K1*	9.075 *K1*				$10.35	$9.05	$8.15
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.625 *S2*			
	Los Angeles, Torrance, Cal.										6.175 *B2*			
	Minnequa, Colo.										5.625 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.60 *C7*							5.675 *C7*	$10.35 *C7*	$9.05 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.025 *R3* 5.375 *T2*	$9.70 *T2*	$8.40 *T2*	
	Houston, Tex.										5.625 *S2*			

IRON AGE

STEEL PRICES

(Effective June 5, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem				5.575 *B3*	7.425 *B3*	6.80 *B3*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	6.30 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.60 *W6*
	Claymont, Del.							5.35 *C4*		6.30 *C4*	6.725 *C4*	
	Coatesville, Pa.							4.80 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.50 *A2*	5.575 *A2*		6.725 *A2*	
	Harrisburg, Pa.							5.10 *P2*	5.575 *C3*			
	Hartford, Conn.			6.75 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.60 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.70 *W10*		7.60 *W10*						
	Camden, N. J.			6.70 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.80 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.70 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	4.80 *M7*	4.80 *M7*	6.70 *W11* 6.45 *C14* 6.70 *B5*		7.725 *A5,B5*		4.50 *R3*				6.90 *A5* 6.90 *W6*
	Spring City, Pa.			6.35 *K4*		7.60 *K4*						
MIDDLE WEST	Alton, Ill.	4.85 *L1*										6.775 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N5*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		6.25 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E1*				
	Chicago, Joliet, Ill.	4.65 *U1, N4,W8,R3,* 5.15 *P13*	4.65 *N4,R3,* 5.15 *P13*	6.25 *B5,W8, W10,A5,L2*	5.575 *U1,R3, W8*	7.425 *A5,W8, W10,L2,B5*		4.50 *U1,W8, I3,R3* 4.725 *A1*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.60 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	6.25 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.60 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.60 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.45 *B5* 6.50 *P3* 6.10 *P8*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3, P8*	6.90 *G3*	4.60 *G3*			6.825 *G3*	
	Duluth, Minn.											6.60 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	6.25 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1,I3, Y1*	4.50 *I3, U1, Y1*	5.575 *I3*	6.30 *U1,Y1*	6.725 *U1, I3,Y1*	6.35 *M4*
	Granite City, Ill.							4.70 *G2*				
	Kokomo, Ind.											6.70 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.70 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		6.25 *C10*	5.75 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	6.25 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.60 *A5,J3, P6*
	Portsmouth, Ohio											6.60 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1,Y1, C10,R3*	4.65 *U1,Y1, R3*	6.25 *Y1, U1*	5.575 *U1,Y1, C10*	7.425 *Y1,C10, F2*	6.80 *U1,Y1*	4.50 *U1,Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.60 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.35 *K1*	5.35 *K1*		6.625 *K1*		7.50 *K1*	5.20 *K1*		7.00 *K1*	7.375 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.85 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.70 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.55 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.85 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.55 *C7* 7.55 *C6*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	5.15 *A8*	5.15 *A8*									6.80 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,R3* 5.15 *C16*	4.65 *T2,R3* 5.15 *C16*				6.80 *T2*	4.50 *T2,R3*			6.725 *T2*	6.60 *R3,T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.60 *S2*		6.40 *S2*	6.825 *S2*	6.85 *S2*

Steel Prices *(Effective June 5, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Youngstown *R3*	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75								
Fontana *K1*	6.00	13.25	9.00	+9.25	11.50	+5.75	14.00	+4.00	14.50	+3.00	15.00	+2.50	16.50	+1.75								
Pittsburgh *J3*	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Sharon *M3*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Fairless *N2*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Pittsburgh *N1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Wheatland *W4*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Youngstown *Y1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Indiana Harbor *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75								
Lorain *N2*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Youngstown *R3*	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75								
Fairless *N2*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Fontana *K1*	10.50		14.50		16.50		17.00		17.50		18.00		18.50									
Pittsburgh *J3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Alton, Ill. *L1*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Sharon *M3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Pittsburgh *N1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Wheeling *W5*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Wheatland *W4*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Youngstown *Y1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Indiana Harbor *Y1*	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Lorain *N2*	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.60	T-1
18	4	1	—	5	2.305	T-4
18	4	2	—	—	1.765	T-2
1.5	4	1.5	8	—	.96	M-1
6	4	2	6	—	1.35	M-3
6	4	2	5	—	1.105	M-2

High-carbon chromium	.77 D-3, D-5
Oil hardened manganese	.42 O-2
Special carbon	.39 W-1
Extra carbon	.33 W-1
Regular carbon	.275 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b

	Cladding	Plate (*A3, J2, L4*) 10 pct	Plate (*A3, J2, L4*) 15 pct	Plate (*A3, J2, L4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	30.30	33.15	36.05	32.50
	316	35.50	38.45	41.40	47.00
	321	32.00	34.85	37.75	37.25
	347	34.40	37.90	41.40	48.25
	405	25.80	29.60	33.35	.....
	410, 430	25.30	29.10	32.85	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 42.75; 1 side, 33.75.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	8.40	8.60	.....
Armature	9.35	9.60	10.10
Elect.	9.95	10.20	10.70
Motor	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain Oriented	
Trans. 58	13.85	Trans. 80	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

LAKE SUPERIOR ORES

51.50% *Fe natural content, delivered lower Lake ports. Prices for* 1956 *season. Freight changes for seller's account.*

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.25
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Cal	Woven Wire Fence 9-15½ ga. Cal	"T" Fence Posts Cal	Single Loop Bale Ties Cal	Galv. Barbed and Twisted Barbless Wire Cal	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	152	162		173	175	7.40	7.80
Aliquippa, Pa. *J3*	152	162				7.40	7.80
Atlanta *A8*	154	167		177	180	7.60	8.125
Bartonville *K2**	154	168		175	181	7.60	8.20
Buffalo *W6*						7.50	7.90
Chicago, Ill. *N4***	152	166		175	179	7.50	8.10
Cleveland *A6*	157					7.50	.....
Cleveland *A5*						7.40	.....
Crawfordsville *M4**	154	168		177	181	7.60	8.20
Donora, Pa. *A5*	152	162		175	175	7.50	7.90
Duluth *A5*	152	162		175	175	7.50	7.90
Fairfield, Ala. *T2*	152	162		175	175	7.50	7.90
Galveston *D4*	157						
Houston *S2*	157	170			180	7.65	8.05
Johnstown, Pa. *B3**	152	166			175	7.40	7.80
Joliet, Ill. *A5*	152	162		175	175	7.50	8.10
Kokomo, Ind. *C9*	154	154		177	177	7.60	8.00
Los Angeles *B2**						8.35	8.925
Kansas City *S2*	157	167		178	180	7.65	8.05
Minnequa *C6*	157	167	162	178	180	7.65	8.05
Monessen *P6*	152	162				7.40	7.80
Moline, Ill. *R3*		162	162				
Pittsburg, Cal. *C7*	171	185		199	195	8.45	8.85
Portsmouth *P7*						7.50	.....
Rankin, Pa. *A5*	152	162			175	7.40	7.90
So. Chicago *R3*	152	162	157	173	175	7.40	7.80
S. San Francisco *C6*				197	195	8.35	8.75
Sparrows Pt. *B3**	154			175	181	7.60	8.20
Struthers, O. *Y1*						7.50	8.00
Worcester *A5*	158					7.70	8.20
Williamsport, Pa. *S5*			160				

Galvanized products computed with zinc at 5¢ per lb Exceptions: *zinc at 12.5¢ per lb; ** 13¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bristol, Conn. *W12*	.....	.....	10.90	13.05	15.75
Buffalo, N. Y. *R7*	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. *S9*	.....	9.05	10.60	12.75	15.35
Cleveland *A5*	7.10	9.05	10.60	12.75	15.45
Detroit *D1*	7.20	9.15	10.70	12.85	.....
Detroit *D2*	7.20	9.15	10.70	.....	.....
Harrison, N. J. *C11*	.....	.....	10.90	13.05	15.75
Indianapolis *C5*	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. *B4*	7.00	8.95	10.50	12.65	.....
New Haven, Conn. *D1*	7.55	9.35	10.90	13.05	.....
Pawtucket, R. I. *N7*	7.65	9.35	10.90	13.05	15.75
Pittsburgh *S7*	7.10	9.05	10.60	12.75	15.45
Riverdale, Ill. *A1*	7.20	9.05	10.60	12.75	15.45
Sharon, Pa. *S1*	7.10	9.05	10.60	12.75	15.45
Trenton *R4*	.....	.....	.....	.....	.....
Wallingford *W1*	7.55	9.35	10.90	13.05	15.75
Warren, Ohio *T4*	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. *W3*	7.10	8.95	10.50	.....	.....
Worcester, Mass. *A5*	7.65	9.35	10.90	13.05	15.75
Youngstown *C5*	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	32.09	37.37	29.93	.....
	2½	12	43.22	50.31	40.31	.....
	3	12	49.90	58.10	46.55	.....
	3½	11	58.26	67.83	54.34	.....
	4	10	77.36	90.07	72.17	.....
National Tube	2	13	32.09	37.37	29.93	.....
	2½	12	43.22	50.31	40.31	.....
	3	12	49.90	58.10	46.55	.....
	3½	11	58.26	67.83	54.34	.....
	4	10	77.36	90.07	72.17	.....
Pittsburgh Steel	2	13	32.09	37.37	.....	.....
	2½	12	43.22	50.31	.....	.....
	3	12	49.90	58.10	.....	.....
	3½	11	58.26	67.83	.....	.....
	4	10	77.36	90.07	.....	.....

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery Charge ‡‡	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (10 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 As rolled
Baltimore	$.10	7.31	8.32	8.37	7.65	.....	7.63	7.93	7.61	8.62	14.38	13.44-13.96	16.36	16.29-16.49
Birmingham	.15	6.80	7.93	8.85	7.06	.....	6.99	7.25	7.08	9.35	.....	.....	.....	.....
Boston	.10	8.22	9.17	10.42	8.31	.....	8.51	8.37	8.37	9.96	.....	13.76	.....	16.81
Buffalo	.15	7.35	8.40	10.16	7.50	.....	7.80	7.75	7.50	8.05	.....	13.65	.....	16.70
Chicago	.15	7.28	8.39	9.25	7.36	.....	7.60	7.58	7.42	7.90	.....	13.30	.....	16.30
Cincinnati	.15	7.40	8.38	9.10	7.60	.....	7.89	8.05	7.66	8.30	13.59	13.55	16.44	16.60
Cleveland	.15	7.28	8.39	9.10	7.46	.....	7.77	7.91	7.48	8.15	13.41	13.36	16.26	16.41
Denver		8.60	10.76	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.15	7.47	8.58	9.53	7.49	.....	7.88	8.05	7.70	8.19	13.70	13.54	16.55	16.59
Houston		7.85	8.75	10.49	8.15	.....	7.80	8.20	8.25	9.85-9.95	14.35	14.00	17.15	17.05
Kansas City	.20	7.47	8.76	9.17	7.73	.....	7.66	7.95	7.75	8.52	13.87	13.52	16.72	16.57
Los Angeles	.10	8.25	10.10	11.10	8.60	.....	8.85	8.40	8.25	11.00	.....	14.50	.....	18.10
Memphis	.10	7.12	8.25	.....	7.38	.....	7.31	7.60	7.40	9.15	.....	.....	.....	.....
Milwaukee	.15	7.37	8.48	9.34	7.45	.....	7.69	7.75	7.51	8.09	.....	13.29	.....	16.39
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.55	.....	.....	.....	.....
New York	.10	7.88	8.98	9.73	8.33	.....	8.31	8.21	8.26	9.87	.....	13.67	.....	16.72
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.44	8.54	9.51	8.09	.....	7.82	7.85	7.83	8.62	.....	13.45	.....	16.50
Pittsburgh	.15	7.28	8.39	9.55	7.46	9.25	7.60	7.58	7.42	8.15	13.85	13.30	16.25	16.20
Portland		7.80-8.60	8.80-10.15	10.65	8.00	7.95	7.75	7.85-8.15	7.95	12.20	.....	15.00	.....	17.50
Salt Lake City	.20	.....	10.60	.....	9.35	.....	.....	9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.30	9.75	10.25	8.45	.....	8.40	8.35	8.25	11.55	.....	14.50	.....	19.00
Seattle	.00	8.75	10.50	10.90	8.90	.....	8.50	8.50	8.60	12.25	.....	14.75	.....	17.80
St. Louis	.15	7.57	8.68	9.54	7.65	.....	*7.89	7.95	7.71	8.44	.....	13.49	.....	16.59
St. Paul	.25	7.94	8.59-9.14	9.89	7.72	.....	7.65	7.94	7.74	8.51	.....	13.51	.....	16.31

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

*Plus analysis charge. ‡Deduct for country delivery.

(Effective June 5, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	4.725	5.65	5.825				
So. Chicago *R3*				8.05			
Ensley *T2*	4.725	5.65					
Fairfield *T2*		5.65		8.05		5.625	
Gary *U1*	4.725	5.65				5.625	
Ind. Harbor *I3*	4.725		5.825	7.90		5.625	
Ind. Harbor *Y1*				8.05			
Johnstown *B3*		5.65					
Joliet *U1*			5.825				
Kansas City *S2*				7.90			
Lackawanna *B3*	4.725	5.65	5.825			5.625	
Lebanon *B3*							12.15
Minnequa *C6*	4.725	6.15	5.825	7.90		5.625	12.15
Pittsburgh *O1*					11.90		12.15
Pittsburgh *P5*							12.15
Pittsburgh *J3*				8.05			
Seattle *B2*				8.40		5.775	12.65
Steelton *B3*	4.725		5.825			5.625	
Struthers *Y1*				8.05			
Torrance *C7*						5.775	
Williamsport *S5*		5.65					
Youngstown *R3*				8.05			

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.00 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.75
Chicago, f.o.b.	27.00
Detroit, f.o.b.	27.50
New England, del'd	28.55
Seaboard, N. J., f.o.b.	26.75
Philadelphia, f.o.b.	26.50
Swedeland, Pa., f.o.b.	26.50
Painesville, Ohio, f.o.b.	27.50
Erie, Pa., f.o.b.	27.50
Cleveland, del'd	29.43
Cincinnati, del'd	28.59
St. Paul, f.o.b.	26.50
St. Louis, f.o.b.	28.50
Birmingham, f.o.b.	25.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
5	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	64.42
Electrodeposited	56.78
Brass, 80-20, ball anodes, 2000 lb or more	60.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 2¢ per lb)	21.25
Nickel, 99 pct plus, rolled carbon.. (rolled depolarized add 3¢ per lb)	90.50
Cadmium	$1.70
Tin, ball anodes and elliptical.	$1.06 to $1.10

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	83.50
Copper sulphate, 5 or more 100 lb bags, per cwt	21.15
Nickel salts, single, 4-100 lb bags	33.25
Nickel chloride, freight allowed, 300 lbs	43.50
Sodium cyanide, domestic, f.o.b. N. Y. 200 lb drums (Philadelphia price 21.80)	21.55
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 1 to 20 100 lb drums	30.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts Full case	Full case 20,000 lb. Quantity or more
½ in. & smaller x 6 in. & shorter	61	63
Larger than ½ in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex, HP, reg. & hvy.

¾" or smaller	64	66
⅞" to 1⅛" inclusive	63	65
1¼" to 1½" inclusive	65	67
1⅝" and larger	61	63

C.P. Hex regular & hvy.

¾" or smaller	64	66
⅞" and larger	61	63

Hot Galv. Nuts (all types)

1½" or smaller	44	47

Finished, Semi-finished, Hex Nuts

¾" and smaller	66	66
⅞" and larger	63	63

Add 25% for less than case or keg quantity.

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount Bright Treated	H.C. Heat
New std. hex head, packaged ¼" thru ½" diam. x 6" and shorter	34	20
9/16" and ⅝" x 6" and smaller and shorter	31	16
¾", ⅞", 1" x 6" and shorter	9	+11
New std. hex head, bulk* ¼" thru ½" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	43	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

		Discount Mach. Screws	Stove Bolts
Packaged, package list		27	38
Bulk, bulk list	*Quantity*		
¼-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

		Discount Hex	Square
Packaged, package list		24	27
Bulk, bulk list	*Quantity*		
⅜-in. diam. & smaller	25,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	113.1
New York	125.6
Chicago	127.5
San Francisco-L. A.	134.8

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 87, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$122.00
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$128.00
Childs, Hays, Pa.	138.00
Chicago District	138.00
Western Utah	144.00
California	151.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O.	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	32.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$91.00
Standards chemically bonded, Curtner, Calif.	101.25
Burned, Balt.	85.00

Magnesite Brick

Standard Baltimore	$114.00
Chemically bonded, Baltimore	102.00

Grain Magnesite

St. ¾-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed	$64.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	40.00
in sacks	46.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$15.00
Midwest	15.60
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	9.50¢
Canadian sponge iron, Del'd in East carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe.	86.0¢ to $1.55
Aluminum freight allowed	
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.00 to $3.25
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed, #80	$1.18
Silicon	43.50¢
Solder powder.	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	18.75¢ to 32.50¢

THIS PROPOSAL CAN SAVE *YOU* REAL *MONEY*

Reports on capital investment savings on the purchase of Portage 4″ spindle Horizontal Boring, Drilling and Milling Machines have been as much as 20%. In addition, the initial saving is only part of the story. When you consider operating expense vs. capital investment . . actual dollars saved are even greater than the initial 20%.

It will pay *you*..in more ways than one..to get a proposal from Portage before making a final buying decision.

Write for the Portage No. 4 catalog.

THE Portage MACHINE CO.

1035 Sweitzer Avenue • Akron 11, Ohio

Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

Ferroalloy Prices

(Effective June 5, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	38.50	0.20% C	35.50
0.03% C	38.00	0.50% C	35.25
0.06% C	36.50	1.00% C	34.00
0.10% C	36.00	1.50% C	33.85
0.15% C	35.75	2.00% C	33.75

4.00-4.50% C, 67.70% Cr, 1-2% Si... 26.25
2.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 25.00
0.025% C (Simplex) 31.75
0.10% C, 50-52% Cr, 2% max Si.... 23.75
8.50% max. C, 60-65% Cr, 3-6% Si.. 22.50
8.50% C, 50-55% Cr, 3% max Si.... 22.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.27
0.50% max. C	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe..	1.36

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅛" thick) delivered packed. 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	1.25
Ton lots	1.27
Less ton lots	1.29

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	41.35
Ton lots	46.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	22.95
Ton lots	25.25
Less ton lots	26.75

Calcium-Maganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.75
Johnstown, Pa.	10.75
Sheridan, Pa.	10.75
Philo, Ohio	10.75
S. Duquesne	10.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.00
Ton lots packed	15.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$92.00
19 to 21%	3% max.	94.00
21 to 23%	3% max.	96.50

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	31.5
Ton lots	33.5
250 to 1999 lb	35.5
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 22.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	34.00	36.55	37.75
0.07% max. C	31.95	34.50	35.70
0.10% max. C	31.20	33.75	34.95
0.15% max. C	30.45	33.00	34.20
0.30% max. C	28.95	31.50	32.70
0.50% max. C	28.45	31.00	32.20
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	25.45	28.00	29.20

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carload bulk	12.00
Ton lots	13.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	13.55
Ton lots, packed	15.75

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	22.75	21.45
98% Si, 1% Fe	23.25	21.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	7.15
Ton lots, packed	9.75

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	12.75	75% Si	15.40
65% Si	14.50	85% Si	17.10
	90% Si	18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 42.6-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo $1.34

Ferrocolumbium, 50-60%, 3 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.65

Ferromolybdenum, 55-75%, 200-lb

containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium 25% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $200.00

Ferrotungsten, ¼ x down,

packed, per pound contained W, ton lots, delivered..... $3.45

Molybdic oxide, briquets, per lb

contained Mo, f.o.b. Langeloth, Pa. $1.32
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.30

Simanal, 20% Si, 20% Mn, 20%

Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	17.50¢
Ton lots, packed lump	19.50¢
Less ton lots	20.00¢

Vanadium oxide, 86-89% V_2O_5

contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium contract basis, per lb of alloy

35-40% f.o.b freight allowed, carloads, packed	26.25¢
12-15%, del'd lump, bulk-carloads	8.50¢

Boron Agents

Borosil, contract prices per lb of

alloy del. f.o.b. Philo, Ohio, freight allowed. B 3.14%, Si 40-45%, per lb contained 2.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%,

Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50% min. B, 1.50%

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14 to 19% B	1.20
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No. 1	$1.05
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15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
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Ton lots	$1.48
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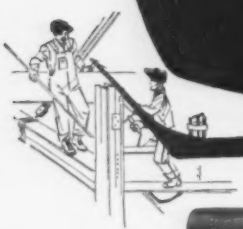

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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

No Slump Seen . . . While a number of observers in other industries pointed to slowing sales last week, used machine tool sellers in the **Midwest** were reporting a still advancing sales rate, heavy inquiry levels, and a continuing scarcity of items to sell. Customers were in far better supply than was the equipment they were hoping to buy.

When sales figures are finally tabulated, it's a safe guess that May sales levels will exceed the April figure by at least 5 pct and perhaps as much as 10 pct. More important, many of the small shops that weren't too confident about future prospects back in April are now talking about hitting a high for the year in May. They see unlimited good prospects ahead, with some slowdown as is seasonally normal during the hot weather months.

One of the biggest sales items over the past 30-60 days have been screw machines, with just about everything else on the used tool dealer's list enjoying good business. Sheet metal working equipment, for instance, which has now been a leader for months in unit sales volume, is still enjoying an excellent demand level and there seems to be no indication of a dropoff in sheetworking equipment in the immediate future despite the heavy sales levels over this long period of time.

Widespread Demand . . . Just about anything that will work flat rolled steel is needed, and demand is coming into the Chicago area from far distant points including the Gulf Coast, the East Coast, and the West Coast. The West Coast has always been a good customer for heavy metal shaping equipment, but is now emerging as a strong demand area for sheet - and - light - plate working equipment as well. With very little being thrown on the open market in the way of presses and press-brakes, auction prices are being bid up for these items. Even former customers of the used tool dealers are bidding up the auction prices.

Price Sensitivity Absent . . . A list of machine tools in short supply and heavy demand would cover just about every type traded in the used market, including particularly heavy lathes, jig borers, milling machines, radial drills, and shapers — the items mentioned most frequently when a dealer is asked what type of equipment he finds toughest to locate.

One bright spot — customers aren't overly price conscious. One afternoon last week a tool dealer sold a customer an item and shipped it within the half-hour with a heavy duty low cost work table. Customer called back, wanted the machine but asked for a specific work table on it at a considerably higher cost. Money wasn't the object, the right kind of equipment was.

Dealers Happy . . . It's no secret that used machine tool prices have been advancing since late summer 1955 and that by now the advance is general. Most dealers argue that their price advances haven't equalled advances they themselves have had to pay to get equipment into stock. At any rate, customers aren't fighting too hard, and it takes some looking to find a dealer who won't admit that business is great.

Rebuilding levels are even higher than surging demand levels for "as is" and reconditioned equipment. Here spare parts are a real stumbling block.

The outlook: excellent. Whatever may be happening to the rest of the economy, used tool men are feeling pretty good.

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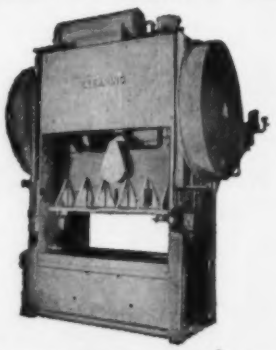

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800 CFM Fuller Rotary Compressor 100 PSI, 150 HP 3/60/4160. New 1953.

1350 CFM Fuller Compressor 50 PSI, New 1950.

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304 HP Kewanee Firetube Boilers 125 PSI.

32" Newton Saw — 75 ton Slug Press

15" Slitter — Littel 5G Uncoilers

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We own and offer subject to prior sale:
2—80 ton WHITCOMB diesel electric, 650 HP, new 1944
2—45 ton PORTER diesel electric, 300 HP, new 1942
Full data and prices on request. May be inspected in operation

Pan American Engineering Company

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FOR SALE

1 Charging Machine. Manufactured by Electric Furnace Company, Salem, Ohio. Bridge 12' x 19' 6". Bridge travel full length of shop if necessary. Depth of furnace 8 to 10 feet stroke of three prong peel about 10 feet. Used for charging boxes of copper forgings into and out of annealing furnaces. Parts all intact. Needs paint. Electric controls in fair shape.

The Commercial Forgings Co.

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Byers Master Crawler Crane, Full Revolving, 45 ft. boom. Cheap.

Expert Concrete Breakers

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ARNOLD HUGHES COMPANY

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RECIRCULATING PIT DRAW FURNACE

Lindberg Type 4348E-16 Temp. 1600°F. 3 sets of 43 Dia. x 48 Deep Work Baskets. Power Demand—110KW—Complete with Controls.

JOE MARTIN CO., INC.
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25 TON GEN. ELECTRIC LIKE NEW
1—35 TON & 2—45 TON PORTERS A1.

USED STEEL SHEET PILING

377 PCS CARNEGIE M116—40' & 58'

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CONTRACT MANUFACTURING

DROP FORGINGS

To Your Specifications
Prompt Quotations

BALDT ANCHOR CHAIN & FORGE DIVISION

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DROP FORGE DIES

Forging Engineers—Die sinkers—Manufacturers of drop forge dies and hot work tools for presses and upsetters.

COMMERCIAL DIE COMPANY

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THE FORMULA:

Multi-operation presses
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Yankee skilled workmen
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Eighty years manufacturing know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.

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Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.

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Contract Machine Work

Parts and Complete Machines, Heat Treating and Grinding. Mail Blue Prints for Quotations.

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SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
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Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.

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Special Forgings of Every Description.
We solicit your prints or model for quotation.

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EMPLOYMENT EXCHANGE

EMPLOYMENT SERVICE

SALARIED PERSONNEL $5,000 to $30,000—This confidential service, established 1927, is geared to the needs of high-grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. JIRA THAYER JENNINGS P. O. Box 674, Manchester, Vermont.

SITUATION WANTED

SALES EXECUTIVE, age 32, unmarried, proven sales ability, wishes to join American industrial or mining organization as traveling salesman or executive in any part of the world. Experience purchasing and selling Europe/Americas metals, scraps and metal products. Used to extensive international traveling by plane and car, expert in international business, familiar with English, French, German, Spanish, Italian, Portuguese and Dutch. Accustomed to hard work, energetic and enterprising. Dutch nationality, possessing U.S.A. visitor's visa valid until 1960. Address Box G-346, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

TECHNICAL DIRECTOR—15 years' proven ability in sheet metal manufacturing and finishing as Chief Metallurgist, Executive Assistant. Age 38. Resume upon request. S. S. Rice, Circuit Avenue, Watertown, Conn.

SITUATION WANTED

GRADUATE MECHANICAL ENGINEER—IN EXECUTIVE CAPACITY AS FACTORY MANAGER, CHIEF ENGINEER OR ASSISTANT. NINETEEN YEARS OF DIVERSIFIED ENGINEERING AND MANAGEMENT IN MACHINE TOOLS AUTOMATIC MACHINERY AND PRODUCTS. SEVEN YEARS OF PRACTICAL FACTORY OPERATIONS INCLUDING COST AND SALES. ADDRESS BOX G-350, CARE *THE IRON AGE*, CHESTNUT & 56TH STS., PHILADELPHIA 39.

HELP WANTED

ROLL TURNER—Merchant Bar Mills 18" and 12"—Regular and special bar sections. Furnish resume, age, experience, references and salary expected. Address Box G-340, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

TECHNICAL PUBLICIST—New York Industrial Public Relations Agency needs young man with flair for the written word and appreciation of industrial marketing problems. Will assist head of agency, and partnership is definitely in the cards for the right man. Engineering degree not necessary but some industrial experience is. Agency is small and growing, so only those interested in the long haul need apply. Replies held confidential. Address Box G-347, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

HELP WANTED

STEEL WAREHOUSE MAN with experience in sheets, bars, structurals, aluminum, etc., required for inside sales and purchasing in order department of a large well-rated, long established N.E. Philadelphia warehouse. Must be management material and capable of assuming responsibility. Salary open. Moving expense allowance. Write complete background giving age and experience. Replies kept in strict confidence. Our men know of this advertisement. Address Box G-344, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

PLANT ENGINEER—$10,000 plus profit-sharing, benefits. Background in production control, cost control, scheduling, plant services, and job-shop experience in steel or metal fabrication. Age 30-40. Excellent opportunity. Greater New York area. Address Box G-345, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

PROGRESSIVE MIDWEST SCRAP IRON FIRM has an excellent opening for a salesman interested in calling on industrial scrap accounts. Here is an outstanding opportunity. We are seeking an aggressive individual who has the desire and ability to build up an industrial following and earn an excellent income. Send complete resume to: Address Box G-348, care *The Iron Age* Chestnut & 56th Sts., Philadelphia 39.

METALWORKING BRIEFS

Machine Tool Program Hit

The Senate Small Business Committee is readying a report scorching the Defense Dept. for sloppy handling of its machine tool program. Principal criticism is that the now three-year-old Vance Committee recommendations were accepted, but never put into practice; that only $16 million out of appropriations totaling $450 million have been committed for standby machine tools; that the services have done little to keep the machine tool industry ready for mobilization.

Nickel Distribution Under Scrutiny

Allocation system for non-defense nickel is going to get a searching examination from the Senate Small Business Committee. Questions: Is the original entitlement program, under which non-defense nickel is voluntarily allocated, fair? Can the Government police present systems adequately to prevent diversion?

Construction Stays at High Level

Despite some slowness in home building, new construction in April totaled $3.3 billion, bringing the four months total to $11.8 billion. This equals the record figures of 1955. New April records were set in highways, office buildings, stores, and sewer and water facilities. Industrial plant expansion set a new record for any month.

More Trouble Ahead for Auto Industry

Auto layoffs climbed 18,000 to a total of 185,000 in the final full week in May. The figure represents an increase of 48,000 in automotive unemployed in the month, according to the Dept. of Labor. Meanwhile, automakers scheduled more production cuts.

Installment Buying Rate Behind 1955

Consumers credit buying added $296 million to the outstanding installment credit during April. This is the largest monthly rise of the year, but well behind the $539 million gain of April, 1955, the Federal Reserve Board reports.

Broader Allocation Powers for President

Amendment to the Defense Production Act, as approved by the Senate Banking Committee, gives the president broader power to allocate nickel and other tight materials.

Lincoln Electric Expands

An $8 million foreign and domestic expansion program to meet demand for welding equipment is under way at Lincoln Electric Co., Cleveland.

ADVERTISERS

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

IN THIS ISSUE

Blanks that machine so beautifully

An expert job of finish-machining is possible only when the blank itself is sound. Bethlehem circular steel blanks have the soundness and strength that enable the machinist to work with complete confidence.

Bethlehem's manufacturing process is unique. Combining both forging and rolling, it produces a blank with uniform density and smooth, regular grain flow. The metal is solid and clean, and it cuts away fast. There is no hidden trouble under the surface that might slow the job or cause rejection.

Ask your shop to try these easy-to-work-with blanks. Available in sizes from 10 to 42 in. OD, heat-treated or untreated, they are recommended for gears, crane wheels, clutch and brake drums, sheave wheels, flywheels, pipe flanges, and many other circular steel products.

BETHLEHEM STEEL COMPANY
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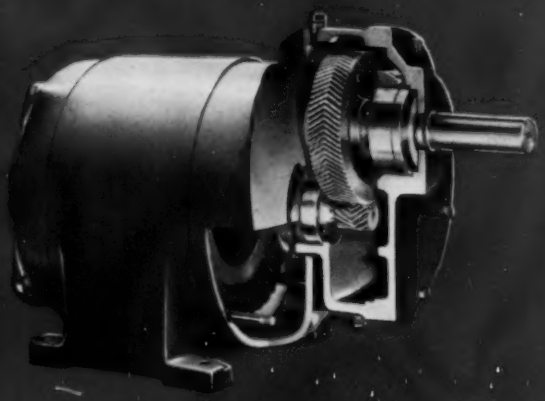
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



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Parallel Shaft Type

MASTER -1st Choice for GEARMOTORS

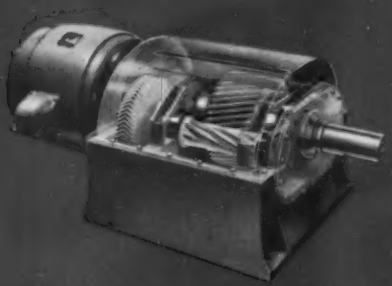
Because...

...With five types of parallel and right angle Gearmotors, Master has the flexibility and choice of design you need for selected output speeds.

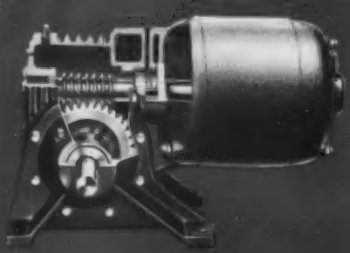
...With electric motor and gears combined into a compact, integral power unit, you reduce costs and increase efficiency through elimination of belts, couplings, chains, sprockets, external bearings or separate reducers.

...Available in sizes from 1/8 to 125 H.P. You can integrate with the gearmotor electric brakes—3 types of variable speed units and fluid drive in any combination.

...And that's why more gearmotors carry the Master name than all other makes combined. Write on your business letterhead for details.



DOUBLE REDUCTION
Parallel Shaft Type



SINGLE REDUCTION
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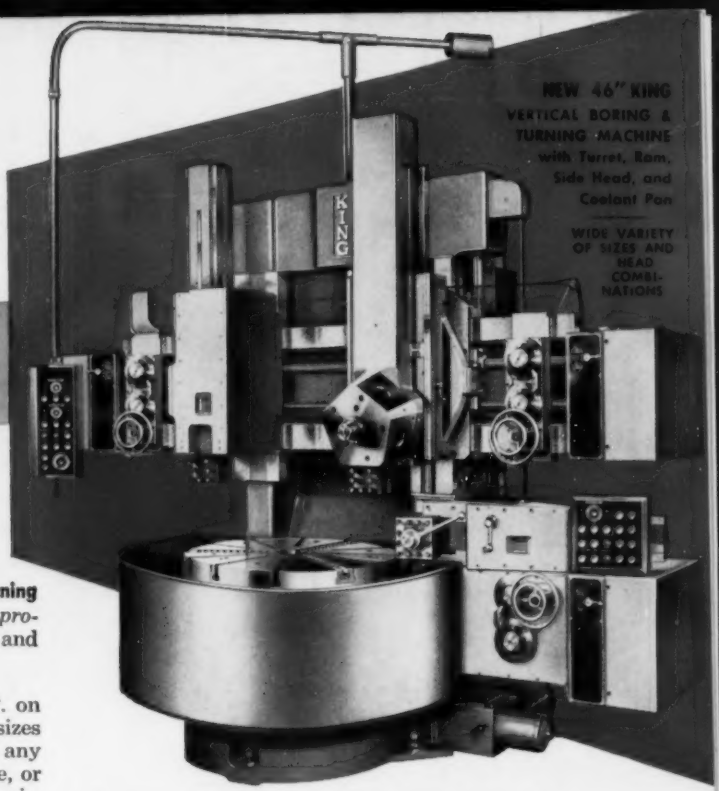
POWERED FOR PRODUCTIVITY

...the all new

KING

greater horsepower — expanded speed and feed ranges — permit use of modern cutting tools to their fullest capabilities



Completely re-designed King® Vertical Boring & Turning Machines bring to boring mill users the *greatest productive capacity ever achieved* for vertical boring and turning work.

Horsepower has been increased to 40 to 50 H. P. on 30″ to 46″ machine sizes; 75 to 100 H. P. on sizes 56″ and up. Spindle drive provides 24 speeds in any one of three standard ranges: high, intermediate, or low. As illustrated below, complete drive transmission is mounted in an extra-rugged housing, providing greatly increased stability. The entire drive can be removed from the machine as a unit.

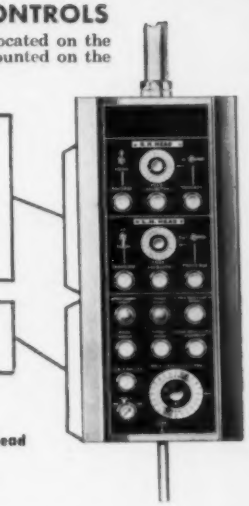
24 feeds from .0016″ to .250″ per revolution are provided. The exact feed can be selected to produce the desired surface finish on any material at the required production rate.

Complete electrical controls are provided, located on pendant station and on fixed panel mounted on side head, for maximum ease and speed of manipulation.

With many other features, the *all new* King provides industry with a high-efficiency machine tool capable of taking full advantage of new cutting tools, new materials, new methods. For full details, send for new Catalog K-5. Write direct or to the King distributor in your area.

COMPLETE ELECTRICAL CONTROLS

All electrical controls are conveniently located on the pendant station and on a fixed panel mounted on the side head, as follows:



LOCATED ON PENDANT—

Feed and rapid traverse movements — and — Pre-selective feed selection from direct-reading dials: for rail heads on machines with two heads on rail . . . for rail head and side head on machines with one head on rail.

Power swiveling of rail heads

Pre-selective speed selection from direct-reading dial

Speed change • Turret index • Table stop

LOCATED ON SIDE HEAD PANEL—

Feed and rapid traverse movements of side head — and — Pre-selective side head feed selection from direct-reading dial: on machines with two heads on rail.

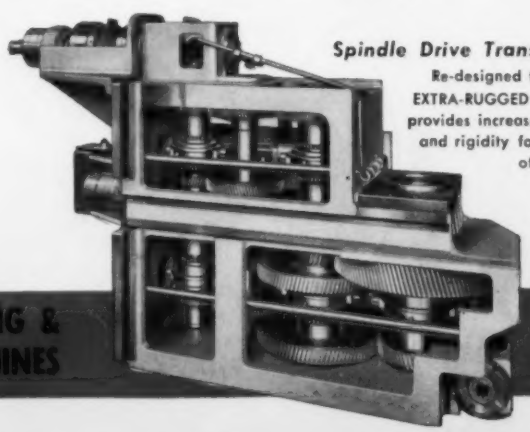
Main drive • Rail positioning • Coolant pump

Thread cutting and taper turning selection for all heads

Additional Features of the ALL NEW KING

- **NEW SPINDLE AND SPINDLE MOUNTING, PROVIDING MAXIMUM TABLE STABILITY.**
- **AUTOMATIC LUBRICATION OF ALL MOVING PARTS.**
- **ANTI-BACKLASH NUTS FOR ALL CROSS-FEED MOVEMENTS.**
- **MACHINE ADAPTED FOR SIMPLE OPTIONAL ADDITION OF:**

Automatic positioning of heads.
Automatic tracing control of heads.
Automatic cycling.
Power rail clamping.
Power indexing of turrets.



Spindle Drive Transmission

Re-designed throughout. EXTRA-RUGGED HOUSING provides increased stability and rigidity for mounting of the shafts.

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Short shafts used throughout with points of

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